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JANUARY 1987

VOLUME 5
NUMBER 1

**CRITICS' CHOICES:
BEST GAMES OF 1986**

FAMILY COMPUTING

Personal Finance: A Guide to Organizing Your Money

CONTEST

**Computing Family
of the Year
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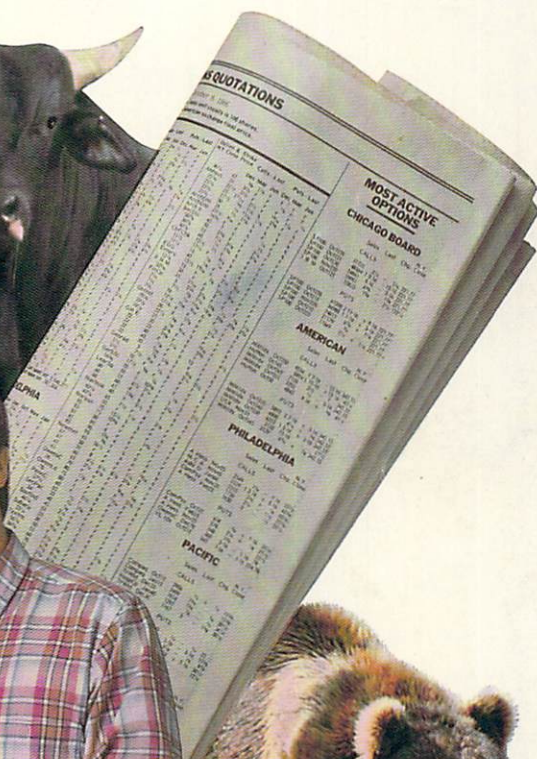
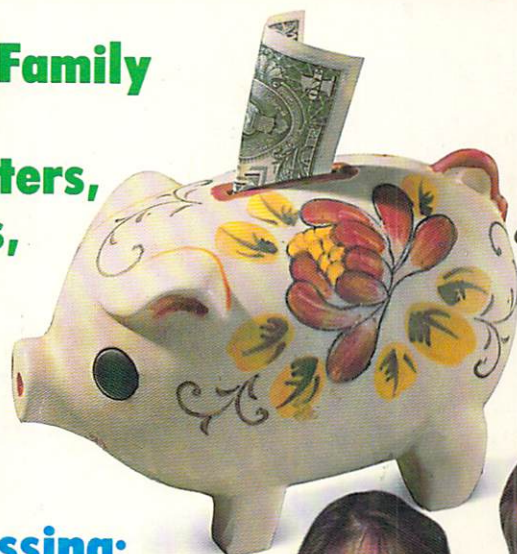
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**How to Build
Your Basic
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600/800XL & 130 XE,
COMMODORE 64/128 & VIC 20,
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SOFTWARE REVIEWS

AMAZING



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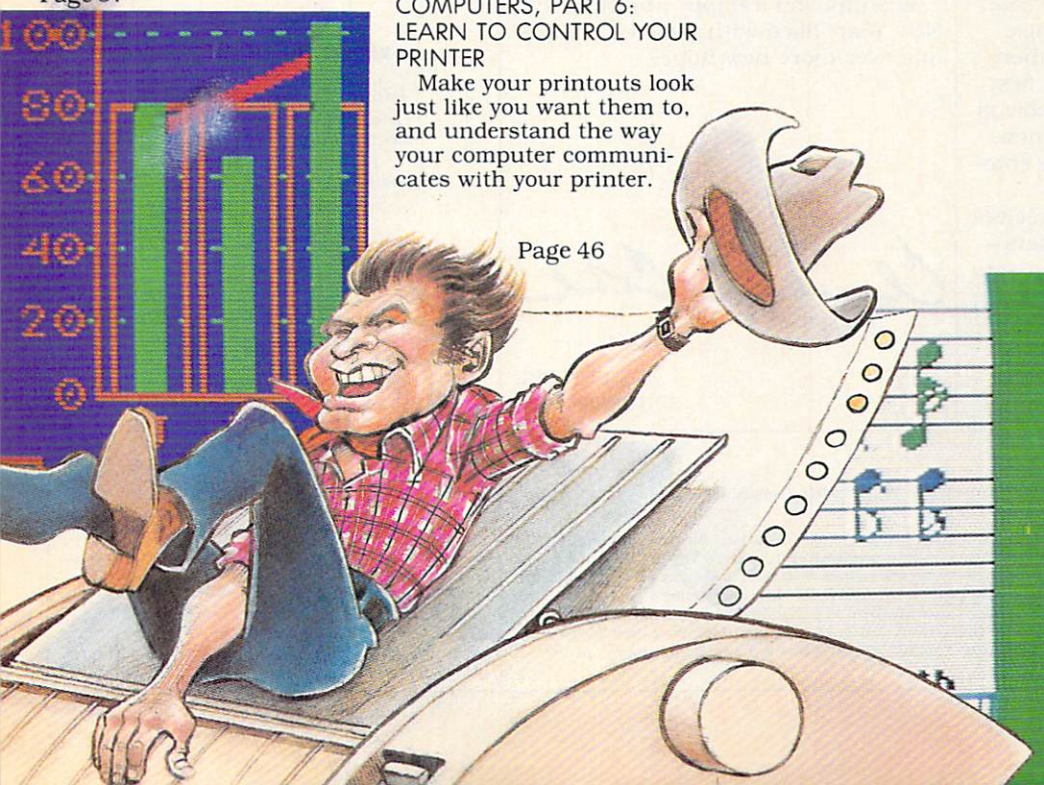
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EDITOR'S NOTE

BEGINNINGS AND RENEWALS

Being in the magazine business, I find it only natural to see the word "renewal" and think "subscriptions." But with a new year beginning, that's not what comes to mind.

This time of promise and time of hope is, I believe, essential for the human soul. Imagine how much drabber things would be without this annual marker that gives us the chance to start, new and again.

Even if I try to avoid the calendar, I can't help but think that I've let an opportunity pass by. There are old, lost friendships that don't have to slip away. There are missed promises to myself to try to achieve an elusive goal, at a time when at last I might succeed. There are angers and hurts that can be thrown away. And there's a world of new experiences to try, each a possible plus that otherwise might have remained unknown.

For many people I know, the computer, too, is an object of promise and hope. And this is a time when many of us approach it for the first time, while others think that now is when we can apply ourselves anew to achieving some of our major computer-related goals.

In this issue, we address ourselves to both kinds of computer owners—the new and the renewed. New users especially will want to read our feature on building a software library (page 48); for more experienced users, the new areas to explore might lie in telecomputing (page 16), per-



sonal finance (page 37), our Computing Family of the Year Contest (page 53), or our programs. But don't be limited by anything but your own interests and willingness to invest your time and energies to expanding your computing horizons.

Wishing you a happy and healthy New Year, filled with realized dreams and ever more new hopes.

CLAUDIA COHL
EDITOR-IN-CHIEF

FAMILY COMPUTING

730 Broadway, New York, NY 10003

(212) 505-3580

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Bruce Gardner (212) 505-3588

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Jonathan Wolpert (212) 505-3628

WESTERN DISTRICT MANAGER:

Pamela Taylor

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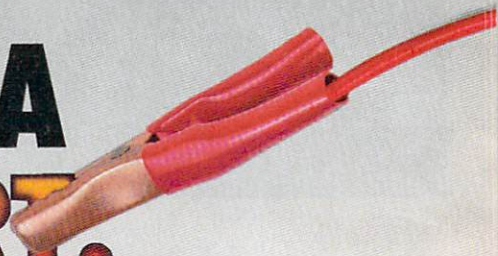
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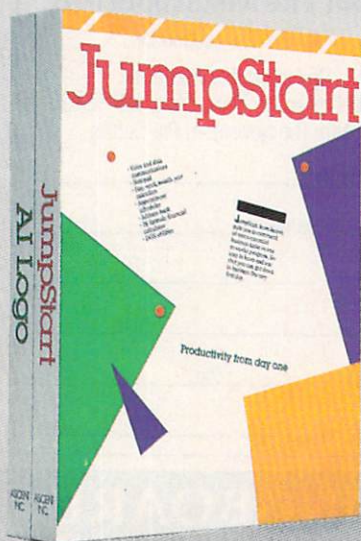
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LETTERS

PROGRAMMING POINTERS

The Leading Edge Model D has received good reviews in FAMILY COMPUTING. So I purchased one that came with the MS-DOS 3.10 and GW BASIC 3.11. Is it possible for me to take advantage of the IBM PC and compatibles programs in The Programmer section of your magazine? So far, I have tried the programs on my Model D, without success. I was looking forward to enjoying the programs in FAMILY COMPUTING.

ALDON SIMS, JR.
Jacksonville, Florida

EDITOR'S NOTE: *Your Leading Edge Model D should run FAMILY COMPUTING programs with the BASIC you have. Be sure to read the footnote below each IBM PC & compatibles program title for hardware requirements, and type in programs exactly as they appear in the magazine.*

There are a couple of problems with your programming section. First, after each program, you should tell readers what the commands mean; then they would learn something. Second, the programs need to be more useful. You should also let the readers send in programs, and publish the best ones.

I still think your magazine is the best computer magazine out these days because it tells readers about all computers, not just one machine.

JASON FEINGOLD
Miami, Florida

EDITOR'S NOTE: *Our two-part "Back to BASIC" programming series that began in December and continues in this issue should answer many of your questions about commands.*

PAY ATTENTION TO ATARI!

In response to one of your answers in the September 1986 Computing Clinic column, James Bancroft asked the question, "Does Atari make any computers that allow more than four colors on a screen in graphics mode?"

You only pointed out the 520 and 1040 ST. You forgot the Atari 8-bit graphic mode 11. This short program I wrote will put up to 16 colors on the screen.

```
10 GRAPHICS 11:REM THIS IS A SEMI-HIGH  
RESOLUTION 16 COLOR MODE  
20 FOR A = 1 TO 79:COLOR A: PLOT A,0:DRA  
WTO A, 191:NEXT A  
30 GOTO 30
```

In graphics mode 11, there are 16 different colors available. In graphics 9, there is one color with 16 luminances. This is done with the GTIA chip. This chip is in all XL and XE machines and in most 400 and 800 machines. Note that these modes don't have text windows.

Also, in your "Buyer's Guide to Computers" in the November 1986 issue, you stated that the Atari 130XE had only three sound channels. You are mistaken. The Atari 130XE has four sound channels.

RICH FANTASIA
Bethpage, New York

DVORAK IS THE KEY

Regarding "Keys to Computing" in your November issue, why not push for the new DVORAK typewriter keyboard instead of trying to teach children the antiquated QWERTY keyboard?

I've found two sources of information about developments in the field of typing education. One is a newsletter, *Dvorak Development*, P.O. Box 717, Arcadia, CA 95521. Edited by Randy Cassingham, the newsletter sells for a subscription price of \$20 per year. The other source is Virginia Russell at Dvorak International, P.O. Box 128, Brandon, VT 05773 ([802] 247-6020).

D.M. CANDERS
Lakeland, Florida

GETTING DOWN TO BUSINESS

Your case study, "Setting up a New Business," in the October issue provided a lot of useful information for beginning entrepreneurs.

You could add the National Association of Women Business Owners (NAWBO) to the list of resources. NAWBO has chapters nationwide and offers newsletters, workshops, public policy support, and perhaps most appealing to the novice self-employer—the networking that can lead to multiple business referrals. The NAWBO headquarters is at 600 South Federal St., Chicago, IL 60605 ([312] 346-2330).

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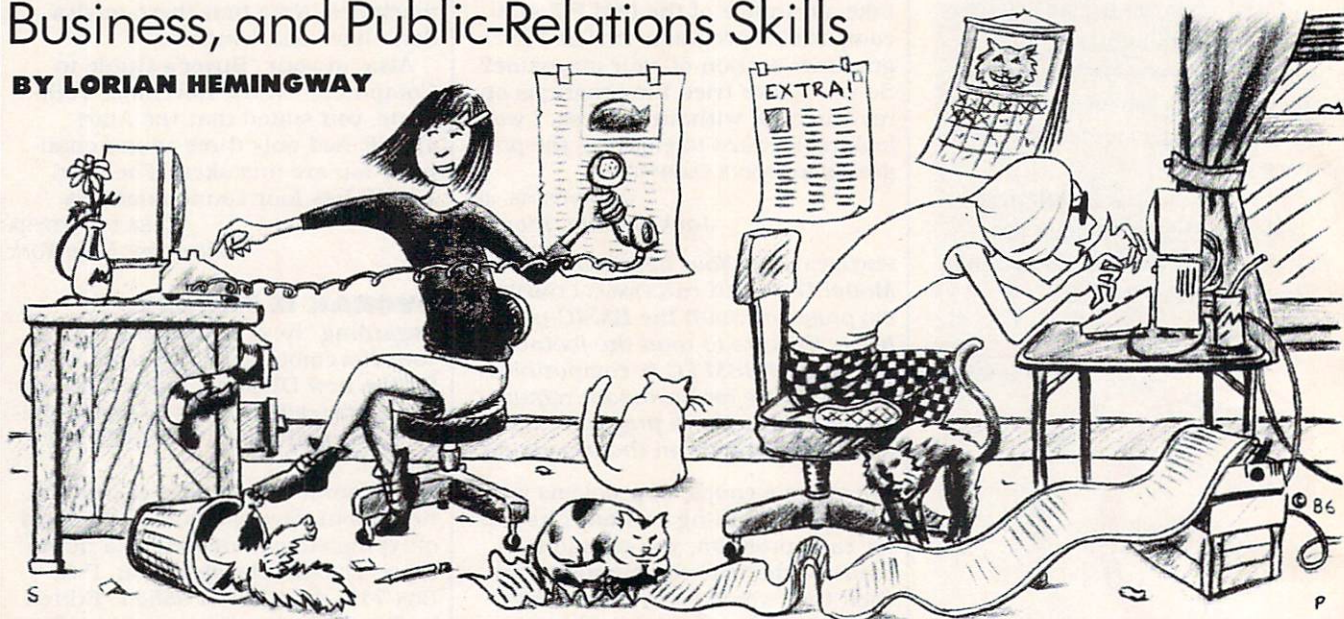
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HOME-SCHOOL CONNECTION

YOUR CHILDREN'S NEWSLETTER BUSINESS CAN YIELD BIG REWARDS

Desktop Publishing Helps Kids Learn Communications, Business, and Public-Relations Skills

BY LORIAN HEMINGWAY



If you're a parent, you know the pride you feel when your children learn from a worthwhile project they've created themselves. In our family, one such project was a monthly newsletter created by my 14-year-old daughter, Cristen, and her 13-year-old friend Megan Woo. The girls came up with an editorial focus, found story ideas issue after issue, researched and wrote articles, composed each issue on the computer, sold subscriptions, and took the flak for their mistakes. They certainly gained more valuable skills in business, computers, language, and human relations than if they'd hung out at the mall the summer they began the project. I admit it was a lot of fun guiding them and seeing the results, and I even managed to learn quite a bit about computers myself!

GETTING THE COMPUTER INVOLVED

If you have a computer at home, your young publishers will probably already know how to use word-processing and graphics programs;

Cristen and Megan had been working with Apple computers at their junior high school before they began their project. It's a good thing they already knew their way around the hardware and software they used, since computers were so crucial to the success of their newsletter. (I, in contrast, have been known to throw out words like "flatware" in computer circles.)

Parents can also use a family or neighborhood newsletter to help their children apply the language and computer skills they've learned at school or on their own. Megan's father, Sherman Woo, is a systems analyst for Pacific Northwest Bell. For work at home, he uses an Apple II Plus, an IBM PCjr, and an Epson printer. Sherman has always taken the time to give kids excellent instruction in the use of computers. In fact, he held a class one night a week to instruct the kids in the basics of computer use. The class was free and open to any child who wished to attend. As a result of the class, Cristen and Megan started exploring new ways to use the computers. Simply playing games on the computers was not as satisfying to them as it had been initially.

They decided to go into business

together with the aid of Sherman's home system and *Volkswriter* (Life-tree Software). Their purpose was to put together a monthly newsletter on the Apple II Plus.

FOCUSING ON AN IDEA

Once your kids decide to venture into newsletter publishing, make sure they pin down an idea that is 1) of significant interest to them and to the audience they plan to reach (whether it's family, friends, schoolmates, neighbors, or city officials); 2) one they have the knowledge and resources to write about; and 3) one that will remain timely for the duration of the project.

I had told them about my experiences in the independent newspaper business; I was about 12 when I cranked out my neighborhood newspaper on an old Royal typewriter. It was a thoroughly capitalistic effort, designed to get spending money from the kids in my neighborhood. Cristen and Megan had a different approach. They wished to write about a subject near and dear to them—cats. The purpose of the newsletter was to instruct subscribers in the care of cats; provide little-known facts about cats (how to get them to cough up a large fur ball

LORIAN HEMINGWAY is a freelance writer living in Seattle, Washington. Her articles have appeared in *Rolling Stone*, *Sports Afield*, and *The Miami Herald*.



VISIT EXOTIC LANDS AND WIN OVER THE NATIVES.

There is a place, probably a long, long way from where you're sitting right now, where grown men actually wear dresses and throw telephone poles in the air as a sign of athletic prowess.

It is true.

There is another rather bizarre land where grown men actually throw *themselves* in the air as a sign of athletic prowess.

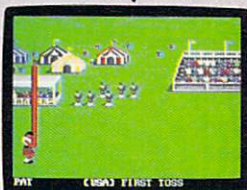
Right off the edge of a cliff.

We're talking, of course, about Scotland's famous Caber Toss and the death-defying divers of Acapulco.

Two of the events you'll find in *World Games*, the newest sequel in our bestselling "Games" series.

Here's your chance to dash around the globe as a big-time international athlete competing in 8 extraordinary sports.

Go stomach to stomach with a 400 pound sumo. Jump barrels in Germany.



Anyone who can throw a telephone pole long distance is entitled to wear a dress.



You haven't lived until you've taken a log out for a spin.

Try Canada's ridiculously difficult log roll. Or ski the brutal, wintry slopes of France.

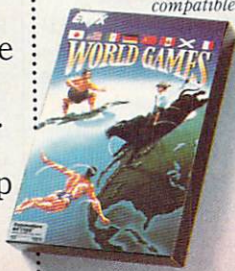
Then it's back to the good old US of A to ride a bucking bull. And off again to bully Moscow with some heavy-duty weight lifting.

If you manage to upset enough countries, your name

will be permanently inscribed in the World Hall of Fame.

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compatibles, Atari ST,
C64/128, IBM &
compatibles.



The question is, are you ready to go the distance?

EPYX

HOME-SCHOOL CONNECTION

was one article); offer and solicit personal stories about cats; and in general to educate the reader in the art of kindness to all animals.

ROLL THE PRESSES!

The difference between putting out a little newspaper on the Royal typewriter and creating one on a computer was dramatic. I hadn't the advantage of being able to edit my text as I wrote, and I slaved away for days trying to get a clean copy, using erasers and carbon paper. In contrast, Cristen and Megan could input copy, make changes, and see the results immediately.

The first issue the girls distributed had hand-drawn cat cartoons because they hadn't yet been introduced to the *The Newsroom* (Springboard Software), a program that would later provide graphics for the newsletter. It was a rough issue, but within a month the kids had eight subscribers. They did word-of-mouth advertising—contacting relatives and asking if they would subscribe and asking them to please pass the word along that they were “in business.” The young entrepreneurs also advertised in local restaurants by posting signs, if the proprietors would let them, and left copies of the newsletter with local business people.

Cristen and Megan named their newsletter *Kitty on the Front Page*, estimated production costs, and set the price at \$6 per year. Eighteen subscribers had signed up after three months, mostly within the Seattle area, with the exception of a very nice woman in Miami, Florida, who loves cats.

By the end of their 18-month trial run, the kids were producing animal graphics (courtesy of *The Newsroom*) in the margins of each page. The graphics were also used to create comical headlines. *The Newsroom* separated the girls' text into columns, which seemed a miracle to a diehard typist like me. Each successive issue looked more professional.

In time, the girls were receiving requests from a few subscribers to publish their stories about cats. I submitted a story titled “My Life with Cats” and was instantly given top billing. It was fun to see my name spread out across the front page of the newsletter with a cat cartoon smiling and pointing to the byline. The kids had become very good at embellishing their text.

They were also experiencing the



Cristen and Megan used *The Newsroom* to give *Kitty on the Front Page* a professional look.

art of writing and editing, and managed tricks with the two computers to help them proofread. With guidance from Sherman, Cristen and Megan connected the Apple to the PCjr with a modem and communications software. Text could be input by Cristen on the PCjr and proofread by Megan on the Apple's monitor, effectively giving the PCjr two monitors. The text appeared simultaneously on both monitors, and the kids could offer suggestions to each other during the editing process, particularly about the spelling. They printed clinkers once in a while, and of course the subscribers let them know about it.

LEARNING FINANCIAL REALITIES

The overhead for the production of each issue of *Kitty on the Front Page* was about \$7 for 25 copies. This included copies made after the final editions had been printed, plus the cost of stamps and bus fare to get to the local copy shop. Subscribers were charged 50 cents per issue and had the right to complain to “the management” if an issue was not received on time. Occasionally, the management would use the proceeds from a particular issue to buy a hamburger at McDonald's, but most often the income was plunked into the Humane Society's nickel-and-dime can at the local 7-Eleven. The girls were learning altruism as well as profit sharing.

Each issue took about eight hours to produce, including stamp-licking and copying. I recalled how much longer it took me to produce my little newspaper years ago, using carbon paper and reams of second-

hand fiber paper. My overhead was considerable and the kids in the neighborhood weren't too interested in buying my paper anyway.

Megan and Cristen ended up \$10 in the hole after their enterprise folded, and they admit freely that they still owe a few subscribers money. They gave up the newsletter because schoolwork interfered with the production, but both have said they would attempt a collaboration again because the challenge of actually making money from the effort appeals to them.

ENCOUNTER WITH REAL LIFE

I interviewed the girls about their independent venture into the publishing world. I wanted to know, as all mothers inevitably do, what they had learned from the experience.

My daughter's immediate response was, “how to get in debt.” Then each girl offered the response I had hoped for. Megan said, “I learned to plan and think things out ahead of time.”

Cristen said she learned how to organize a newsletter and how to work on a computer and feel entirely comfortable while doing it. Whether her school performance was augmented or improved by putting out the newsletter, is hard to say, since she already does very well in school. There's no question that her organizational and computing skills improved. Cristen has a natural ability for math and science, but she really hadn't had a great deal of writing experience until starting *Kitty on the Front Page*.

I asked the girls if their customers were satisfied. Megan said this was “questionable,” mainly because she is worried about not having paid a few quarters back to certain subscribers (I am *two* of those subscribers), and also because the girls received negative comments directed at a particular cartoon they produced. One subscriber said it was in bad taste. But when you're in the newsletter business, you learn to take the good and bad comments in stride. And the kids did.

They learned what it means to be in business on your own. If the computers hadn't been available, they might never have had the incentive to put the newsletter together. They had a subject they enjoyed writing about, a printer to run off their copy the minute it was intact, and a nice little dream of success.

Next time they'll make a profit. **FC**

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*AS COMPILED FROM NATIONAL RETAIL SALES REPORTS

CIRCLE READER SERVICE 6



HOME OFFICE

ORGANIZE YOUR COLLECTIONS BY CHARLES H. GAJEWAY

How to Track Your Movie Tapes, Record Albums, and Other "Things" with Your Data Base

Many computer owners also own videotape and audiotape recorders (or is it the other way around?). I do, and my movie and music collections give me much pleasure. But it isn't easy keeping track of the contents of 200 audiocassettes, 600 record albums, and 100 videotapes. And it's going to get worse because I've started to collect audio compact discs.

So I use a data-base program to organize my collections. The example shown here, "6,000 Songs," is a music catalog. The specific application—tracking songs—may not interest you. But learning how this data-base system works will help you catalog anything you want.

The intended uses for this catalog are quite sophisticated. I frequently make party tapes for dancing and listening, utilizing the more than 6,000 songs in my record and tape collection. This activity requires that I am able to locate songs by artist and length of song.

Since the main purpose of the system is to track individual songs, it is

clear that data-base records (as distinct from phonograph records!) must center around song information. But my music collection is based on albums that contain many songs. If each of 6,000 data-base records contain all the information about the album it is on, data entry would be awkward and slow and disk usage much more intensive than necessary.

It is the difference between what I want to do (put my hands on one of 6,000 songs) and the way I have stored my collection (by album) that makes this application so difficult.

HIERARCHICAL DATA BASES

An elegant solution is to use a data base that can have one file with several subsidiary files linked to it (or, as in the case here, one file with two "screens"). Aptly enough, such a data base is called "hierarchical." It is like an accordion file folder, with several compartments.

I used *The General Manager* (Sierra On-Line, for 64K Apple II). Other hierarchical programs include *Omnis 3 Plus* (Blyth Software, for Apple II, IBM and compatibles, and Macintosh) and *Savvy PC* (The Savvy Corporation, for IBM PC and compatibles). And, of course, you can

also use any of the more powerful "relational" data bases, such as *dBase III Plus*, which allow you to open and work with several files at a time.

Two screens are used in "6000 Songs." To create the catalog, you enter basic album (or tape) data into Screen 1. Then you call up Screen 2, and enter in sequence all the songs and timings on an album. The album information is "generated" (see "Key to Reading 6,000 Songs") on Screen 2 from the fields on Screen 1.

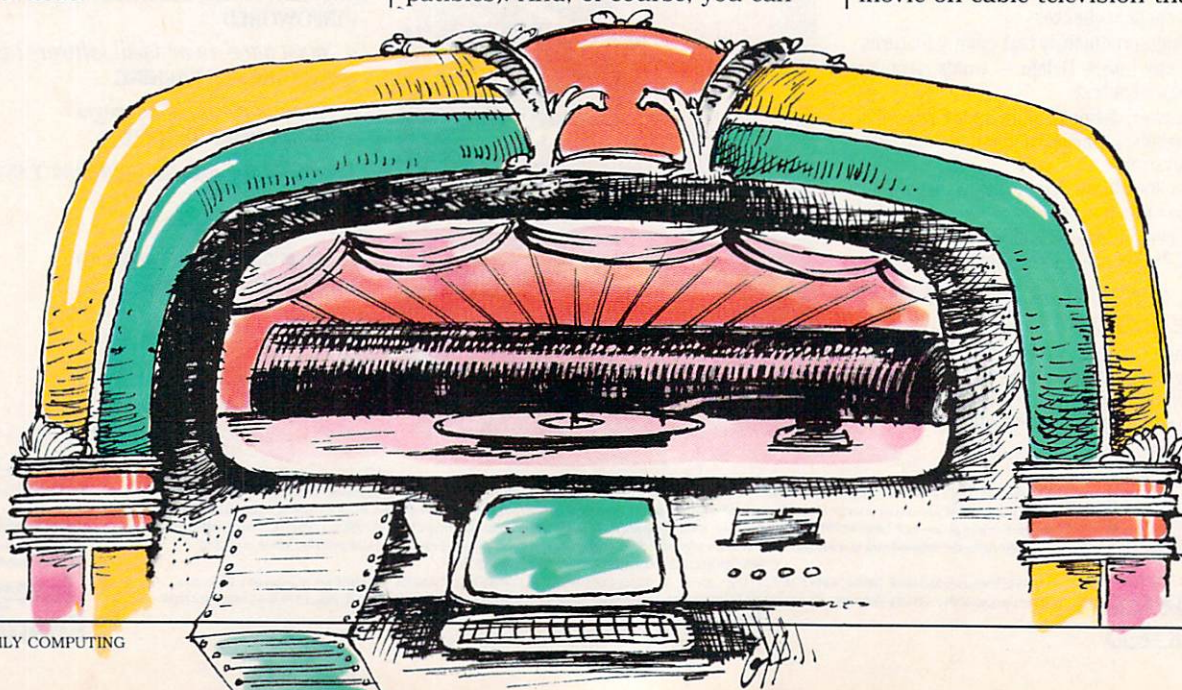
Even if there were 100 songs on a tape, the tape information would only have to be entered and stored on disk once. This is very convenient and economical.

Most searches and sorts will be done on Screen 2, since most of the information required is shown there. Need a Rolling Stones rocker under four minutes? Need a Johnny Mathis ballad between two and three minutes? The answer is at your fingertips!

VIDEO COLLECTIONS

People with large videotape collections could customize the system for their purposes. In fact, I'm doing that for myself, as my video collection continues to grow. Say there's a movie on cable television that lasts

CHARLES H. GAJEWAY, who writes the Apple column in *Machine Specifics*, wrote "Track People and Expenses," another article on using data bases, in the September issue.



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CIRCLE READER SERVICE 28

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*Baron not available for Atari.

2:06 hours, and you want to tape it. By checking your data base, you'll find out which tape has that much time left.

Once you've got your catalog keyed in, you can periodically print out the catalog and have a paper record of all the movies in your library. If you wish, you could even file and retrieve them by category (horror, comedy, etc.).

Many video rental stores now use computers with data-base software to track customer billing, inventory, and revenue per tape, so there's no reason why serious videophiles shouldn't use data bases for their own purposes.

OTHER USES

If you don't care for the above-mentioned applications, there are many other good ways to use a hierarchical data base. You can track any collection of "things," where each "thing" has certain contents. When writing a term paper, you could have various sources, each providing you with a number of notes or citations.

Say you're self-employed and work regularly for 10 clients. You could include information on each client on one screen and the details of each task on the second screen. When it's time to bill the job, you could easily calculate the total bill for each client and have the proper mailing address on hand. At the end of the year, you'd be able to get a full accounting of each task done for each client.

THE REWARDS

These examples point out how useful computerized data bases can be for both personal and professional uses. Automated record keeping and retrieval are probably the most valuable things that computers do. Because the tasks and software are a bit more complex than using a spreadsheet or a word processor, the rewards of a well-designed data-base system are greater. If you start small and build up a step at a time, in a very short while you'll wonder how you ever got along without your data base. **fc**

KEY TO READING "6,000 SONGS"

FLD# and NAME are self-explanatory. (Note that not all programs will accept unnamed fields.) TYPE refers to the data a FIELD will accept, as follows:

V is a variable-length field that can hold letters, numbers, or a combination of characters up to the maximum specified length of the field.

F is a fixed-length field. A certain number of characters must be entered. ZIP codes, phone numbers, and dates are typically entered via fixed-length fields.

G is a generated field. This kind of field "carries" information from another screen or calculation. Data in these fields are not entered by the user.

E is an expansion field, currently empty. If you want to add more albums or artists to one tape, these fields can be made active at a later date without disrupting the structure of the system. Since most programs present some degree of inconvenience in restructuring existing data files to accommodate new fields, it is wise to allow for future expansion when initially creating your data structure.

If a field has been "generated" from another screen, or it is the result of a calculation, REFR indicates where it comes from. In Screen 2, Field 1, S1.1 refers to Screen 1, Field 1. And C1 refers to the first calculation definition, shown at the bottom of the screen.

LEN is simply the maximum number of characters that the field will hold. Many

programs place limits on the length of fields and records, so the user must deal with limited data storage.

"6,000 SONGS"

FILENAME = SONG CATALOG

SCREEN 1:ALBUM

FLD#	NAME	TYPE	REFR	LEN
1	TAPE.SERIES	V		5
2	TAPE.SIDE	F		1
3		E		1
4		E		1
5	ARTIST	V		42
6		E		1
7		E		1
8	ALBUM	V		42
9		E		1
10		E		1

SCREEN 2:SONG

FLD#	NAME	TYPE	REFR	LEN
1	TAPE	G	S1.1	5
2	SIDE	G	S1.2	1
3	ARTIST	G	S1.5	40
4	ALBUM	G	S1.8	42
5	SONG.NUMBER	V		2
6	SONG.TITLE	V		40
7	MIN	V		2
8	SEC	V		2
9	TOTAL SECONDS	V	C1	4

C1 = (SCREEN 2 FIELD 7 * 60) + SCREEN 2 FIELD 8

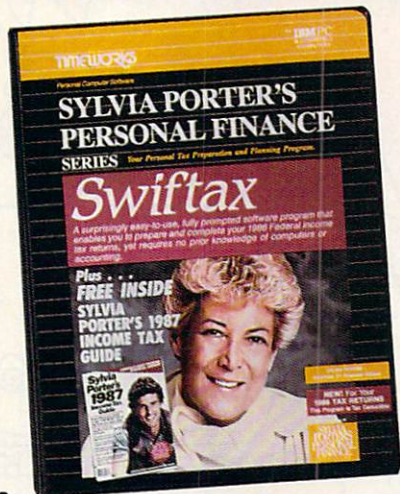
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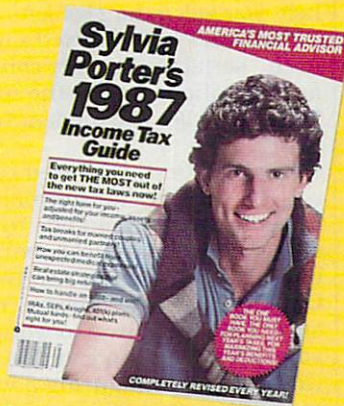
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TELECOMPUTING

"I TRIED TO CALL, BUT. . ."

A Troubleshooting Guide for Modem Owners Who Want to Scream Bloody Murder

BY NICK SULLIVAN

"Garbage in, garbage out" is an old computer expression. Loosely translated, it means that if you tell a computer to do something stupid, it will.

However, when using your modem to make a telephone call with your computer, you can tell it to do something perfectly smart—and it will still do something stupid. This type of disrespect is particularly aggravating to new users, who are just trying to get the hang of things and think their own stupidity is the root of the problem.

Actually, the communications problem could lie with the other computer or with the phone system. In this case, the best solution is to turn everything off and start over again. But, on the remote chance that the problem is at your end, here's a troubleshooting checklist to help you solve the problem.

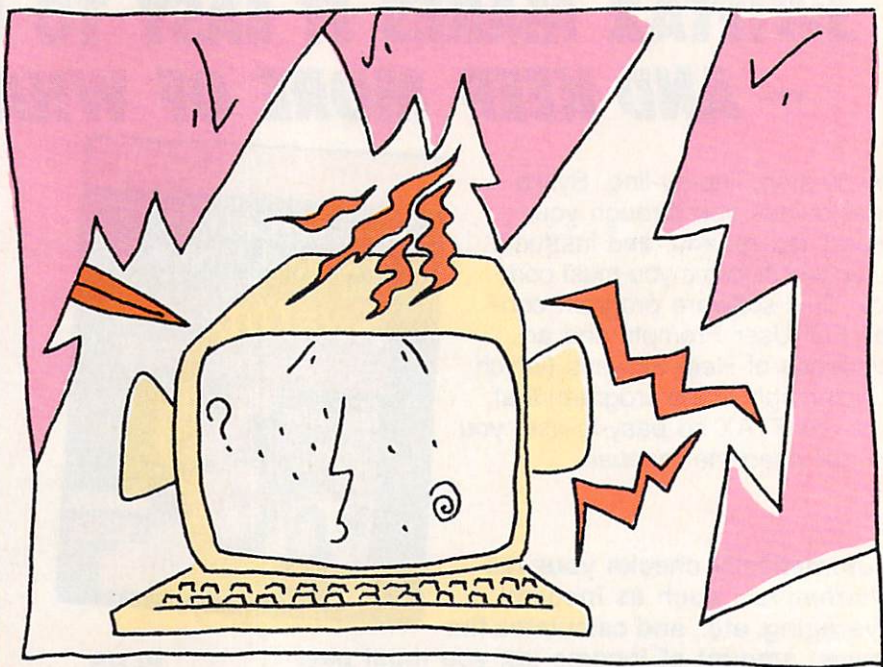
Problem: I've connected my modem to the serial port on my computer, and the phone line to the modem. But I can't get the modem to do anything.

Solution: First, you need communications software (or terminal software) to send commands to your modem. Unfortunately, many modems are sold without software. Once you get the software, make sure it is configured to work with your particular modem. It's much the same as configuring a word-processing program to work with your printer.

Second, if you have a computer that can use a variety of serial cards, you must tell the communications software which one is installed.

Problem: When connected to another computer system, I can't see anything on the screen when I type.

Solution: The remote system is not echoing your keyboard strokes back to your computer. Since other computers can be set up in different ways, the solution is to experiment.



If you're in FULL DUPLEX, switch to HALF DUPLEX. Most communications software also includes an ECHO function. Toggle that back and forth as well.

Toggling from HALF to FULL DUPLEX solves the problem of getting double letters when you type.

Problem: When I dial the phone and connect to another computer system, I get nothing but garbage on my screen.

Solution: Miscellaneous or intermittent garbage is often the result of a scratchy phone line, which rainy weather seems to induce just as it inflames crotchety joints. But a steady stream of garbage probably indicates that your terminal settings are incorrect. Try changing these settings (or parameters) on your communications software.

The most common settings are 8 DATA BITS, NO PARITY, 1 STOP BIT (8.N.1); 7 DATA BITS, EVEN PARITY, 2 STOP BITS (7.E.2); and 7 DATA BITS, EVEN PARITY, 1 STOP BIT (7.E.1). Most systems use one or all of those settings. But some work better than others at different times.

You probably should sign off the system, reset the software, and turn

the modem off and on again, to make sure the settings take hold. By the way, don't try to figure out what the settings refer to. I lost a whole year trying to do that.

Another possible problem is that you are set for 300 baud and calling a 1200-baud phone number, or vice versa. Both computers must be set for the same transmission speed.

Finally, if you are calling Tymnet, one of the packet-switching networks that connects you to information services and electronic-mail networks, you will get a string of xxxxx's, until you type in your "terminal identifier." For most computers, the identifier is A.

Problem: I fire my modem with the command ATDT (ATtention Dial Tone) and a phone number, but nothing happens. (ATDT is the widespread command, initiated by Hayes modems, for dialing a computer from the keyboard.)

Solution: Make sure the modem is turned on and connected to your computer and that the phone line is hooked up. Often, you'll find one piece of the puzzle missing. You also may be dialing over a pulse (rotary) line and not from a touch-tone

Senior editor NICK SULLIVAN wrote "The Computer & The Phone" in the September issue.

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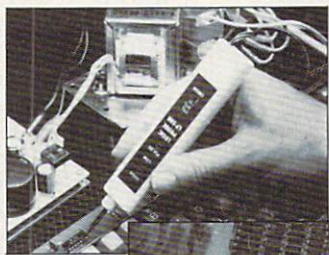
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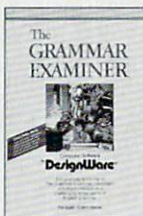


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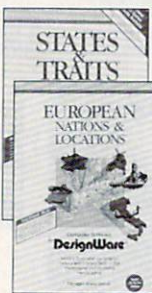
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phone. If so, try the command ATDP (ATtention Dial Pulse), and see what happens.

With some modems, you should dial the phone normally and not by entering a phone number on your keyboard. Check your manual for details. This means you need two phone cables—one from the phone to the modem, and one from the modem to the outside phone line.

Problem: Every once in a while when I'm connected to an outside computer system, I get "knocked off" the phone line without warning.

Solution: Getting "bumped" may just be one of those things that you can't control—something goes haywire somewhere. However, if you have a call-waiting feature on your phone, that's the likely culprit. The only modems I've heard of that do not get bumped by call-waiting are the AT&T Models 4000 and 4112 and Okidata's Okitel 1200.

In any case, make sure the phone line is securely lodged in the jack on your modem.

Problem: When I'm receiving data from another computer, every new line that is sent prints over the previous line, so I can't read the stream of text.

Solution: Most systems send a line-feed signal when sending data, so the lines are shown sequentially, as you'd read them on a printed page. But sometimes you have to insert the linefeed on your end, which is done through your communications software. Read the documentation to find out how your particular software accomplishes this.

Problem: When I'm receiving data from another computer, some letters and words get clipped. For example, I get REW instead of THREW.

Solution: You can fix the LINE DELAY or CHARACTER DELAY settings in your communications software. They're usually preset at 0, so give them higher values (start at 10 and work up), and see if that helps.

Problem: When I try to send or receive a file using the XModem file-transfer protocol, I get the message WAITING TO SEND OR READY TO RECEIVE. Then I receive a series of error statements.

Solution: There may or may not be a solution. XModem is a rather finicky protocol that is very dependent on timing. If the other system does not acknowledge you quickly (or vice versa), the system "times out" and

does not send the file. Sometimes the problem occurs because the two versions of XModem are of different vintage, and you can't do anything about it. Or, the phone system you are dialing through introduces delays you can't control.

However, you can help your cause by rehearsing the steps before instigating the procedure, so that you execute quickly. And you can try reversing the steps. If you've been telling the other system to send via XModem, and then telling your software to RECEIVE under "so-and-so" FILENAME, set up the FILENAME before telling the other system to send. Feel free to experiment. You'll either learn how to do it right or learn that it can't be done.

Problem: I have a "hard-wired" phone line, which I can't disconnect from my phone and plug into my modem.

Solution: Installing a modular jack would solve the problem. Short of that, you'll have to use an acoustic coupler—two suction cups that fit

GLOSSARY

Auto Log-On—A sequence of commands that connects you to a host system and is automatically executed when you press a certain key. Included are the phone number of the system you're calling, your identification number, and password.

Baud rate—The speed at which a modem sends and receives data. The most common rates are 300- and 1200-baud (about one and four pages per minute, respectively), but 2400-baud modems are becoming more popular.

Capture buffer—A part of your computer's memory that can be designated to receive incoming data from a remote computer system and later saved to disk or printed out.

File transfer protocol—A set of rules for sending a file that two computer systems both adhere to. Using formalized rules—instead of merely opening a capture buffer—improves the chances of an error-free transmission. XModem, Kermit, and Vdtext are some of the protocols.

On-line—When your computer is connected to a remote computer by the phone lines, and everything you type is seen by the remote system.

Parameters—The various settings—controlled by communications software—that affect your modem's performance. To communicate, both computers should have the same settings.

Terminal mode—When your computer is connected to your modem and can send commands directly to it (such as ATH, to tell it to hang up the phone), rather than sending commands to your communications software.



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over the earpiece and mouthpiece on your phone and send signals to (and receive them from) your computer. Tandy Computer Centers, among other outlets, sell this rather old-fashioned device.

Finally, you can get an attachment that fits over the mouthpiece of your phone and has a modular jack for a phone line. Thus, you run a line from your modem to the mouthpiece attachment and leave your hard-wired phone as is. Black Jack, sold by The Microperipheral Corporation (\$50), is the missing link.

Problem: At 1200 baud, the text on my screen scrolls too fast for me to read.

Solution: Press CONTROL-S, and most remote systems will stop sending while you catch up on your reading. Press CONTROL-Q and it will start sending again.

Alternatively, activate your printer (check your software documentation

for instructions), and read the print-out later. Or, RECORD the session (again, check the documentation for details), and print it out later.

Problem: When I send a file created with my word processor, it includes margins that make the file look funny.

Solution: Your word processor probably has the margins preset to print out separate pages of paper, with TOP, BOTTOM, LEFT, and RIGHT margins. Just change the margins. Generally, you should set the TOP, BOTTOM, and LEFT margins to 0, and the RIGHT to less than 80 characters. That's because many systems require a carriage return every 80 characters. Also, send the file single-spaced.

Problem: When I tell my communications software to send a file created with my word processor, it gives the message: CANT OPEN FILE.

Solution: This message and similar ones imply that your word processor stores files in a special format that

other software cannot "read." You must first convert the word-processing file to ASCII format (check your documentation for details).

Problem: I can't make heads or tails of the documentation that came with my modem and software.

Solution: Refer to the glossary in this article for an explanation of some frequently used terms. Then just sit down and hammer away. You're just making a phone call—waiting for that high, lonesome sound. **FE**

ELECTRONIC EDITION

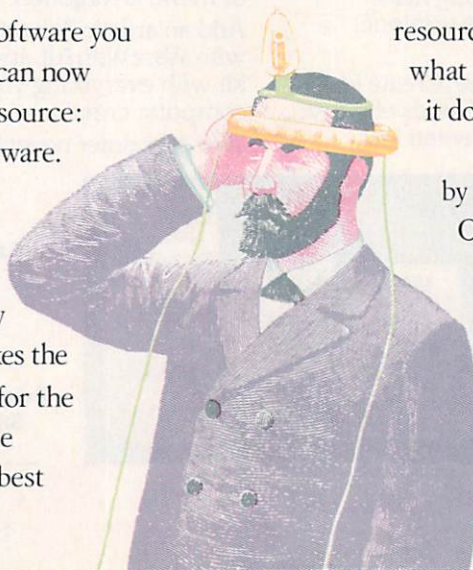
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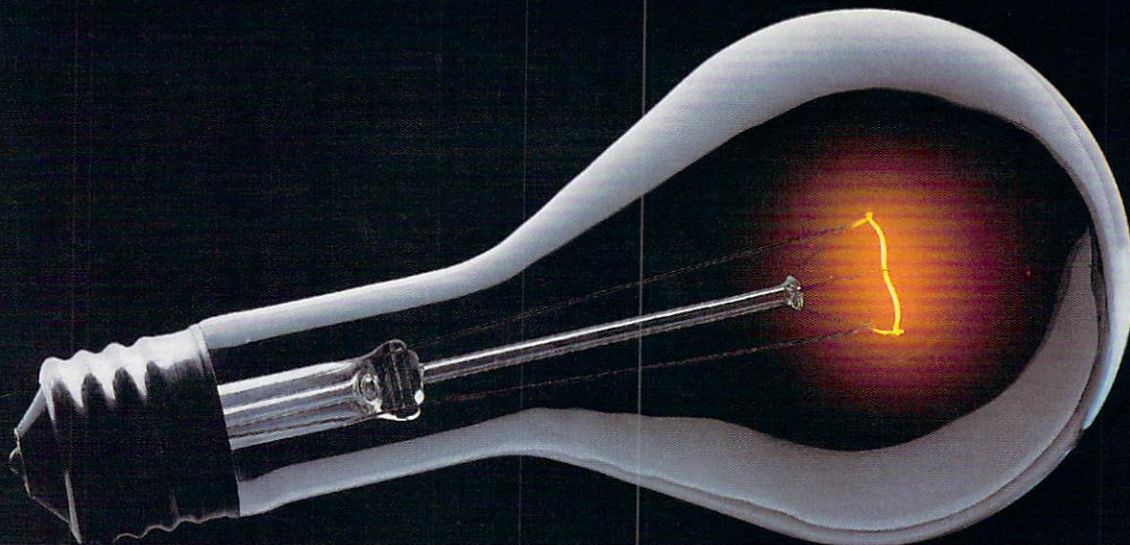


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ENTERTAINMENT

THE CRITICS' CHOICE AWARDS FOR BEST GAMES OF 1986

BY JAMES DELSON

If I had to select one word to describe computer gaming during the past year, the word would be "flourishing." The FAMILY COMPUTING playtesters and I spent over 3,000 hours this past year playing more than 150 games. We saw great leaps forward not only in graphics and sound (thanks to the Macintosh, Amiga, and Atari ST), but in the games themselves, which reached new heights of sophisticated design and sheer playability.

It was hard to choose the best, but after days of deliberation among playtesters and editors, here they are. Our winners are listed alphabetically by category, with the Game of the Year at the end of the list.

ARCADE SHOOT'EM UP **Arcticfox**



When the aliens invade Earth, they won't be coming to downtown Cleveland after all, it seems, but to Antarctica. Only you—driving a wickedly fast, highly armored, heavily armed tank—can stop them. Destroy the aliens' installations while avoiding and eliminating an array of evil enemy arsenal. *Arcticfox* on the Amiga delivers phenomenal graphics and sound effects—it's hot!

Electronic Arts, (415) 571-7171.
512K Amiga, 64K Apple, C 64/128, S33-\$40.

BOARD GAME ADAPTATION **The Chessmaster 2000**

For chess players of all abilities, this simulator is the peak. It in-

cludes practically every option ever offered in any chess program, such as basic and advanced teaching modes, problem solving and game analysis, hints, revolving 3-D and 2-D boards, and a vast library of games. To top it off, the *Chessmaster* is a brilliant opponent, based on a new algorithm for improved play.

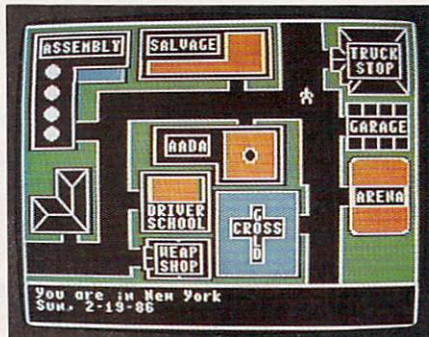
Software Toolworks, (213) 278-8450. 512K Amiga, 64K Apple, Atari, Atari ST, C 64/128, 256K IBM PC/PCjr, 256K Macintosh. \$40-\$45.

CONSTRUCTION SET **Garry Kitchen's GameMaker**

A masterful arcade construction set for building your own games from initial design all the way through to complete, ready-to-play programs. If you're willing to take the time (hundreds of hours are needed for each game made), you'll find *GameMaker* not only fun, but also a valuable educational tool that fosters the pride of accomplishment.

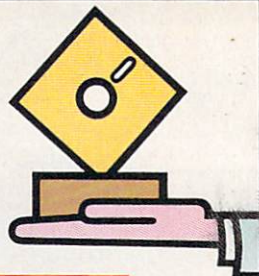
Activision, (415) 960-0410. 64K Apple, C 64/128. \$40-\$50.

HYBRID **AutoDuel**



This futuristic vision of 21st century life on the American highway is also a sign of things to come in computer gaming—the hybrid adventure. Along with the game's role-playing elements, you also enjoy a driving simulation, shoot-'em-up action, and a construction set. Playtesters agreed: *AutoDuel* is fast-moving and funny, colorful and imaginative.

Origin Systems, (603) 644-3360.
Amiga, 64K Apple, 64K Atari, Atari ST, C 64/128, 512K Macintosh. \$50.



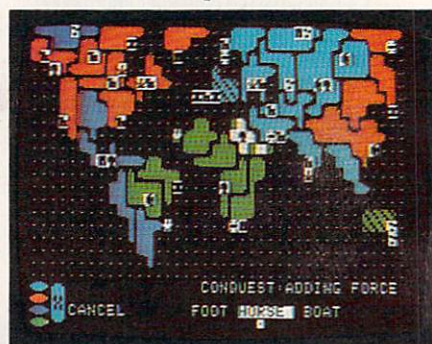
ORIGINAL-FORMAT GAMES

Alter Ego

Not the usual game, but complex entertainment that you can enjoy without the stress of winning or losing. It's a role-playing simulation in which you design a hypothetical modern-day character, then answer questions to direct him or her from birth to death on the adventure of life. *Alter Ego*—a self-awareness tool and a great party game—is available in both male and female versions.

Activision, (415) 960-0410. 64K Apple, C 64/128, IBM PC/PCjr, Macintosh, Tandy 1000. \$50-\$60.

POLITICAL/MILITARY/FINANCIAL **Lords of Conquest**



What do you get when you combine multiplayer negotiations, strategic and tactical planning, resource management, and daring military maneuvering? You get *Lords of Conquest*, 1986's winner in a category considered by many gamers to be the most rewarding of all. By merging a construction set option with the thrills of the board game *Risk*, the political opportunities of *Colonial Conquest* (last year's Game of the Year), and the mercantile balance of *Incunabula*, *Lords of Conquest* offers one to four players a game of power brokering and empire building on a grand scale.

Electronic Arts, (415) 571-7171.
64K Apple, Atari, C 64/128. \$33-\$40.

ROLE-PLAYING ADVENTURE **Wizard's Crown**

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JAMES DELSON has been reviewing entertainment software for FAMILY COMPUTING since our first issue.

(No I.D. required for half-elves.)

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spell. Monsters control
the streets and dun-
geons beneath. Good
citizens fear for their
lives. What's worse,
there's only one tavern
left that serves wine.

But the Bard knows
no fear. With his trusty
harp and a few rowdy
minstrel songs he claims



are magic, the Bard is ready
to boogie. All he needs is
a band of loyal followers:
a light-fingered rogue to
find secret doors, a
couple of fighters
to bash heads, a con-
jurer to create weird
allies, a magician for
magic armor.

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bat, as soon as the Bard
finishes one more verse.
Now what's a word that
rhymes with "dead ogre?"



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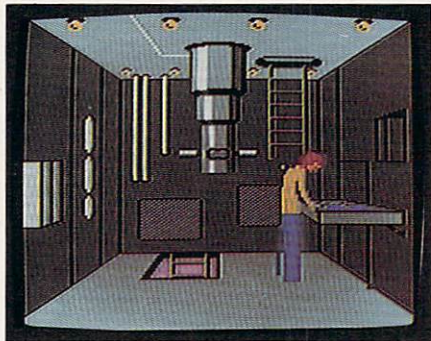
CIRCLE READER SERVICE 21



to all levels of play, try *Wizard's Crown*. This most inventive role-playing fantasy combines an *Ultima*-type game system with complex tactical combat. When battles arise, you make a choice: Play them out in about half an hour or resolve them quickly with one keystroke. It takes over 200 hours to finish, but it's an experience you'll never forget.

Strategic Simulations, Inc., (415) 964-1200. Apple, Atari, C 64/128. \$40.

SIMULATOR Silent Service



It's World War II, the Pacific Theater. You're behind the periscope of a U.S. submarine on a search-and-destroy mission for Japanese convoys. You play on multiple skill levels with a joystick command system, enjoying colorful activity screens that represent various decks and compartments on your sub. What makes *Silent Service* extra special? Even though it was designed for a single player, it's one of those rare simulators that can be enjoyed as a multi-player game, too.

MicroProse Software, (301) 771-1151. 512K Amiga, Apple IIe/IIc, Apple IIGs, Atari, Atari ST, C 64/128, IBM PC/PCjr, Tandy 1000. \$35-\$40.

SPORTS

(Two winners this year—one for arcade-style play, the other based on logic and reasoning.)

Championship Golf: The Great Courses of the World

By employing a breakthrough in gaming graphics, this program lets you play golf on a course that can be seen in wraparound, 3-D, high-res views. Study the terrain, plan strategy, and then swing away, using a difficult but accurate play system.

Gamestar/Activision, (415) 960-0410. IBM PC/PCjr. \$50.

Pure-Stat Baseball

Of all the baseball programs we booted last year, this one's best because it adds a role-playing adventure aspect: Since each ballplayer's statistics can be updated from game to game, the "season" can continue beyond a single play session. The game itself is exciting, with both historical teams from different eras and imaginary teams.

subLOGIC, (217) 359-8482. 64K Apple, C 64/128. \$50.

STRATEGY AND TACTICS

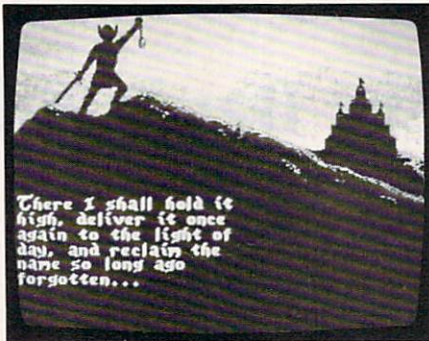
Gettysburg: The Turning Point

An incredibly sophisticated, yet easy-to-learn play system makes a winner out of this exhaustively detailed simulation of the most important battle ever fought on American soil. Each unit's effectiveness is based on the interaction of a large variety of factors, including movement, morale, combat, and command control. *Gettysburg* offers the most accurate simulation of troops in battle we've played, with advanced graphics and a superb computer opponent.

Strategic Simulations, Inc., (415) 964-1200. 64K Apple, Atari, C 64/128, IBM PC/PCjr. \$60.

STRATEGY/ARCADE

Rogue



Intrepid adventurers take off on a 26-level fantasy game in real time. Solo players collect enchanted items, armor, a range of weapons, and

plenty of magic elixirs to reach their quest—an amulet buried somewhere in the dark recesses of an underground labyrinth. Everything in *Rogue* happens without pause, demanding instant reactions.

Epyx, (415) 366-0606. Amiga, Atari ST, IBM PC/PCjr, Macintosh. \$25-\$40.

TEXT/GRAPHIC ADVENTURE Déjà Vu



An intriguing game that places you in the role of a forties-style private detective who must crack a series of cases while overcoming a bout with amnesia. Puzzles galore, superb graphics, and a highly enjoyable play system make this an absorbing winner.

Mindscape, (312) 480-7667. Amiga, Macintosh. \$50.

TEXT-ONLY ADVENTURE Wishbringer

Here's an example of a rare and wonderful adventure, an introductory-level game which is as much fun for experienced players as it is for novices. This is the plot: Unprepared as you may think you are, you must become your town's champion. Use your reason and puzzle-solving abilities to resolve an age-old mystery in order to restore your village.

Infocom/Activision, (617) 492-1031. Amiga, Apple, Atari, Atari ST, C 64/128, IBM PC/PCjr, Macintosh, Tandy Model III. \$35-\$40.

TRADITIONAL STRATEGY Force 400

Our sleeper of the year is an abstract strategy game that combines elements of chess, checkers, and the board game Stratego into a rapidly paced, one-or-two player program. If you enjoy concentrating your mental energies, then you'll find *Force 400* to be a compelling, classic original.

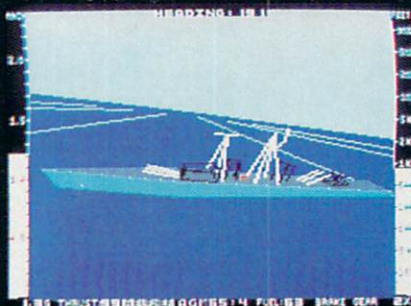
Baen Software, (212) 532-4111. IBM PC, Tandy Models I/III/4. \$35.

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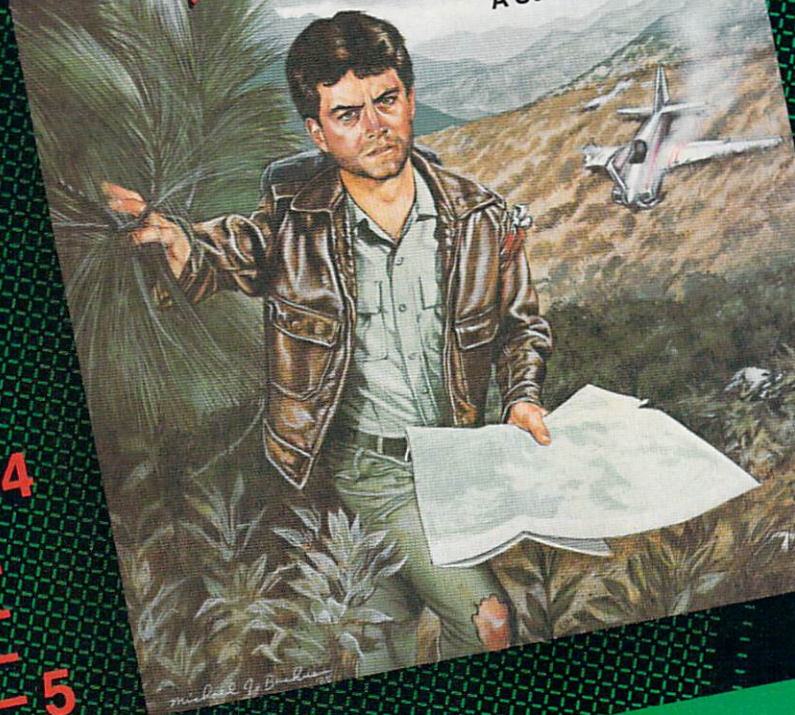


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BEST GRAPHIC ADVENTURE OF THE YEAR Family Computing
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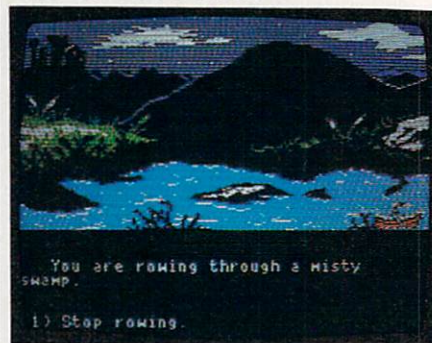
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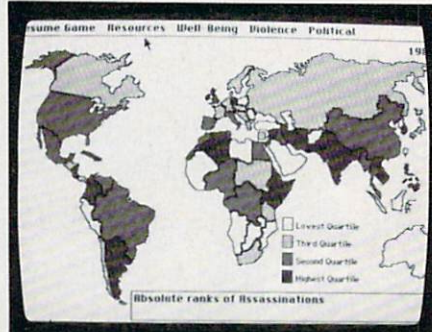
YOUNGSTERS ONLY The Cave of Time



Kids love to play these what-if historical stories not just for their flashy graphics, but because the game transports them to another time and place. Adapted from Bantam's "Choose Your Own Adventure" book series, *The Cave of Time* stimulates the imagination and develops decision-making and reasoning skills for children ages 6 and up.

Bantam Electronic Publishing,
(212) 765-6500. 64K Apple, C 64/
128. \$25-\$35.

GAME OF THE YEAR Balance of Power



Designer Chris Crawford's brilliant simulation of political, military, and financial themes demonstrates the hazards of nuclear brinksmanship in a challenging, yet eminently playable program. As the United States and the Soviet Union, one or two players score points as they guide world events, flex military muscles, and gain esteem through political or diplomatic pressure. Short-term gains are measured turn by turn, but should war occur, the game abruptly ends. The overriding theme of *Balance of Power* shows how difficult it can be to avoid a nuclear war, which neither side can win.

Mindscape, (312) 480-7667.
Amiga, 512K IBM PC, Macintosh.
\$50.



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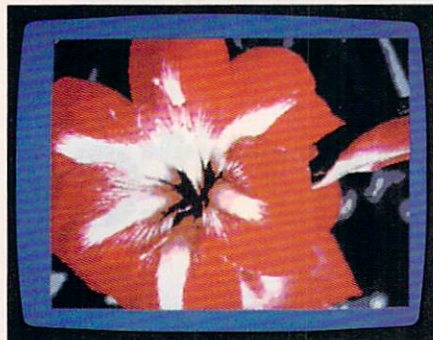
CIRCLE READER SERVICE 40

MACHINE SPECIFICS

APPLE

BY CHARLES H. GAJEWAY

While I wait for new GS-specific software to test on the new Apple machine, here are a few hands-on first impressions. The GS system (\$999), with an external 3.5-inch disk drive (\$399) and RGB monitor (\$499), takes up a bit more space than a IIc but considerably less space than a typical IIe set-up.



Paintworks Plus (Activision) for IIs

Despite incorporating a numeric keypad, the keyboard seems at first to be cramped and toylike. I quickly realized, however, that this was an illusion fostered by the absence of a frame around the keys. In actual use, the keys are well-spaced and give a good degree of tactile feedback. Lefties will appreciate the reversible connections that allow you to put the mouse on the southpaw side of the keyboard.

Color is Key. The new Apple RGB monitor nestles snugly on top of the system unit and produces a very sharp image with well-saturated color. This RGB monitor is clearly the display of choice for the GS and its incredible graphics. And they are incredible, yielding near-photographic quality with GS-specific software. This quality is due partly to higher resolution, but mostly to the amazing spectrum of 4,096 colors.

More Speed. The GS runs more than three times as fast as prior II-series machines. Its average performance, although no match for the Macintosh, is now similar to that of the IBM PC, with spreadsheets and word processors running with more "snap." Even games run more smoothly, with less flickery animation, although some extremely fast games may have to be slowed down to be playable at novice levels.

CHARLES H. GAJEWAY can be reached on *The Source* (ID: BBQ794).

ATARI

BY JOHN J. ANDERSON

Greetings, Atarians. This month I'll devote some space to addressing comments and questions that you've sent in, and then move on to the usual "scuttlebytes."

Some of you who were kind enough to have taken the time to get in touch have accused me of allowing the 8-bit machines to languish in lieu of coverage of the Atari ST. There is simply more news on the ST front, and that's why it gets more coverage. However, I promise, starting now, to devote a keener eye to the 8-bit arena.

XE Keyboard Jitters. I've gotten more than one letter from XE owners having problems with their keyboards. Atari itself acknowledged the problem in a recent technical bulletin. They suggest replacement of a resistor and the use of a piece of tape as a shim under the console key area of the flexible circuit board (inside the keyboard). However, Atari says that this type of repair is best done by computer repair shops.

A more reliable fix is logged in a recent C.H.A.O.S. newsletter, *Mid-Michigan Atari Magazine*. It suggests adding three 1000 ohm resistors to the back of the circuit board, one each from the ground connection (pin 3 of the keyboard connector as seen from the top) to pins 21, 22, and 23 of the keyboard connector.

John Nagy of *Mid-Michigan Atari Magazine* reports that opening the keyboard on your Atari XE can cause the failure of a set of keys. This is due to the breaking of a trace on the flexible circuit inside the keyboard itself. The fix here is to find the break, clean the area carefully, and then apply a "bridge" of conductive paint to make the repair. If you don't have an electronics supplier in your area, try to locate a rear-defroster, wire repair kit at your local auto parts store. Make sure to let the paint dry before reassembly.

AtariWriter Plus DOS Trick. One more 8-bit tip, courtesy of John Nagy: Those of you who have written to complain of the inability of *AtariWriter Plus* to support true double-density disk drives (such as 1050 drive enhanced by ICD's US Doubler), take heart. Yes, *AtariWriter Plus* operates from a built-in version of DOS 2.5. That means it formats a

1050 drive into pseudo dual density.

The answer: Replace the DOS on your *AtariWriter Plus* disk. Even though the disk is copy-protected and will not display a directory from itself, it sports a conventional set of DOS and DUP files. Simply write your DOS of choice directly to the program disk. Don't panic when you get a "bad-sector" error during transfer of DUP.SYS. You're just encountering the copy-protection scheme—not attempting to subvert it. (Note: By tampering with your original program disk, you run the risk of losing it altogether!)

With a DOS such as SMARTDOS, you'll come up with true double-density when running *AtariWriter Plus*. This works on both the regular and 130XE versions.

Please note that if the DOS you install does not support AUTORUN.SYS files, you must be sure to rename the AUTORUN on the *AtariWriter Plus* disk to whatever name it must take to autoboot under your chosen DOS.

Undocumented ST Feature Department. You can use the right mouse button to manipulate files in a non-active (background) window. You do not need to click on the window—just hold the right button down while clicking the left button as though the window were active.

JOHN J. ANDERSON can be reached on *CompuServe* (ID: 76703.654).

COMMODORE

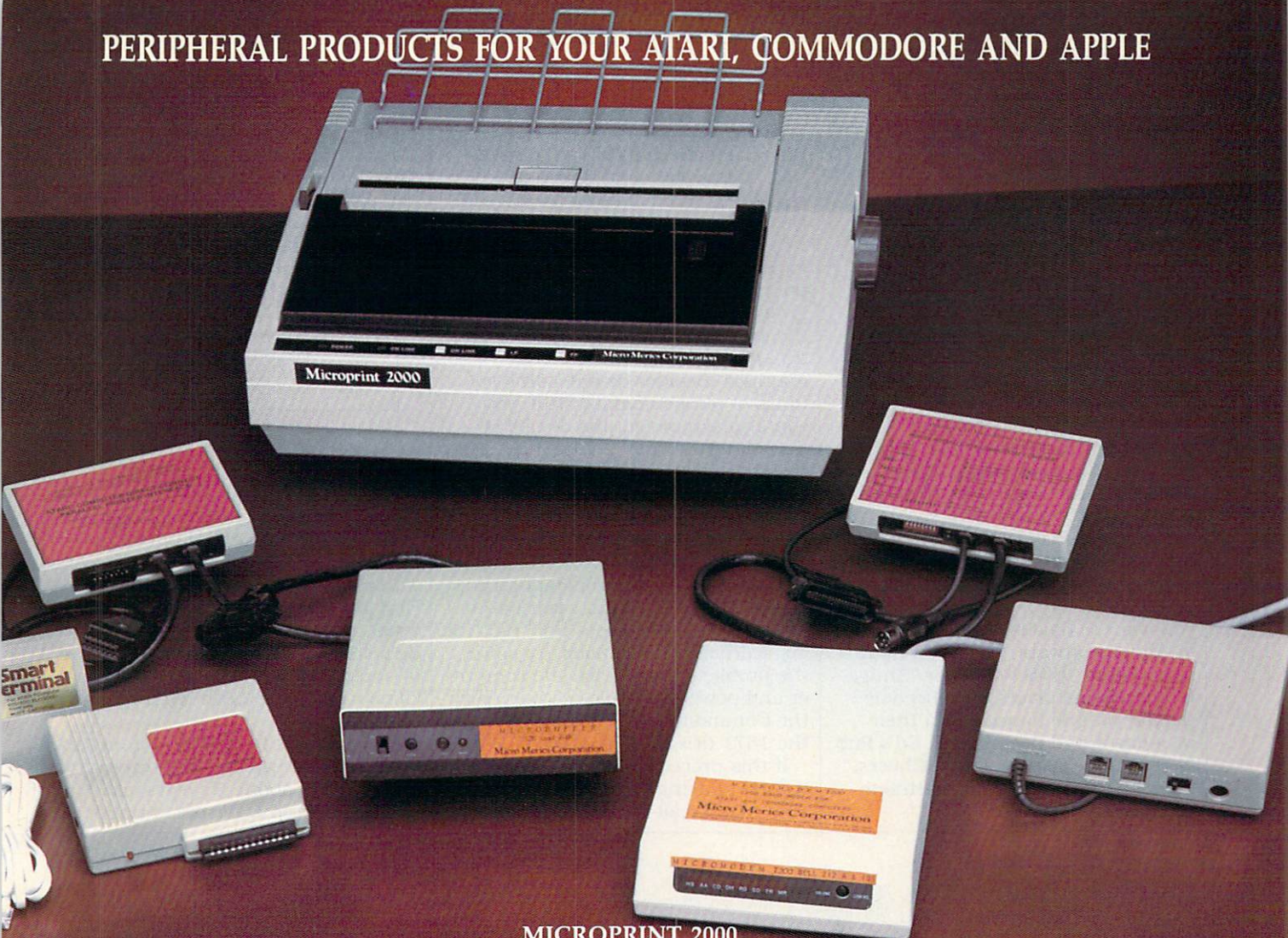
BY SHAY ADDAMS

The Commodore 64/128 has great graphics and sound, but you'd never know that while it's plugged into most on-line information systems. All you're likely to see is straight text. However, QuantumLink utilizes the Commodore's best features because its software was designed exclusively for the C 64/128.

You don't have to learn a lot of arcane commands on QuantumLink ([703] 448-8700) because drop-down menus and function keys facilitate smooth selection of every option. To save incoming text to a sequential file, you just press F3.

People Connection. Q-Link's conference area is called People Connection. Instead of tuning into Channel 32, for example, you type in the name of a room. The left-hand corner of your screen always shows the name of the current room, and the name sets the tone for conversa-

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CIRCLE READER SERVICE 36

MACHINE SPECIFICS



Lucas Films' *Habitat* on QuantumLink

tions that transpire within. This gives the CB environment more structure and sense of purpose than is offered on other systems.

A menu in People Connection lists available rooms, and you can create a new one by typing its name, which is automatically added to the list. If you want to discuss bulletin boards or Amiga software, just open up a room called "BBS Room" or "Amiga Room." Some places have become regular on-line haunts with their own flavor and personality: Ed's Pub is like the television show "Cheers," while the Red Dragon Inn attracts role-playing enthusiasts.

Sample Software On-line.

But many offerings are unique. A hotline lets you send questions directly to Commodore for a reply via electronic mail. There are some unusual clubs; for instance, witches gather in the New Age Forum. Then there's *Habitat* (just getting off the ground and still buggy, as I write), the only on-line multi-player adventure game with animated color graphics. Besides downloading volumes of public domain stuff, you can also sample on-line demos of new software from Broderbund, Activision, Electronic Arts, and other companies.

C 128 in C 64 Mode. Several people have written about C 64 software that refused to load on their 128's. The most common problem occurs when you type GO 64 to enter 64 mode because this does not reset the 1571 drive to 1541 mode. To solve the problem, shut down the computer and power up while holding down the Commodore key, which resets the 1571 drive.

If this procedure doesn't work, or if you're having problems with a 1541 drive, call the software manu-

facturer. A few of them didn't follow Commodore's development guidelines and ran into trouble when the company recently switched drive manufacturers. Most manufacturers have made the necessary changes and will let you trade your program for a new one.

SHAY ADDAMS can be reached on CompuServe (ID: 72267.601) or QuantumLink (ID: JB CHALMER).

MS-DOS

BY STEVE MORGENSTERN

One of the most interesting and controversial developments in computer programming is the introduction of *Turbo Prolog*, from Borland. When Borland introduced *Turbo Pascal* in 1983, it moved Pascal from the academic sidelines into the mainstream of popular programming. Will the same thing happen with *Turbo Prolog*?

Prolog (short for PROgramming in LOGic) was created at the University of Marseilles about 15 years ago. *Prolog* achieved widespread notice

Infocom introduces four new gam

Infocom,™ the crazy people who brought you "Zork"® and "The Hitchhiker's Guide to the Galaxy,"™ has a habit of coming up with games that add a new dimension to interactive fiction. And the best keeps getting better. Case in point: "Leather Goddesses of Phobos."™ It has a scratch n' sniff card and a 3-d comic book to excite all your senses. Once your interest is

piqued, you'll embark on a rowdy romp through the solar system. This hilarious spoof of 1930's pulp science fiction has 3 "naughtiness levels," for the prude to the lewd. "Leather Goddesses" is sure to amuse members of either sex.

One's really warped.

Then there's "Trinity."™ It answers the question of whether a game can be both light-hearted

and profound. You journey through a time warp into a mischievous fantasy world where all atomic explosions are mysteriously connected. "Trinity" takes you back to the dawn of the atomic age and puts the course of history in your hands.

One's a real circus.

It has been said that the circus is the only really mysterious thing left in civilization.

One thing's for sure, there is plenty of mystery in "Ballyhoo."™ While trying to locate the circus owner's kidnapped daughter, you are somersaulted into a three-ring world of deception and crime. To solve the crime

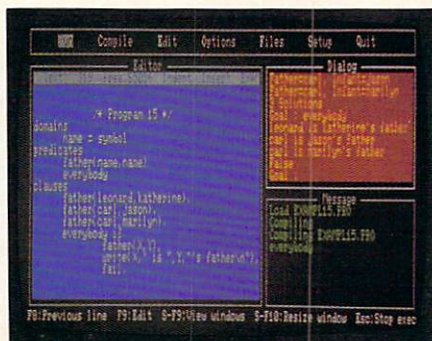


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when the Japanese chose it as the programming language for their "fifth generation" super-computer project. *Prolog* is now accepted as a major element in the development of artificial intelligence projects.

Instant Expert? Now, thanks to Borland, *Prolog* is available on the shelves of every well-stocked computer store, with sharp package graphics and magazine ads that promise the moon and the stars (e.g., "brings supercomputer power to your IBM PC . . . introduces you step by step to the fascinating new world of Artificial Intelligence . . . \$99.95 is an amazingly small price to pay to become an immediate authority—an instant expert on artificial intelligence").

Frankly, you can forget the "instant expert" stuff. Learning *Prolog* is far from "instant." Its structures and techniques are radically different from anything you've programmed before. Most languages are procedural—you write a program that guides the computer step-by-step through the tasks you want it to perform. *Prolog*, on the other hand, is a declarative language. You



Turbo Prolog (Borland): AI At Home

enter a set of facts and rules and pose questions. The language itself then uses facts and rules you provided to arrive at a logical conclusion.

I have been working with *Turbo Prolog* for a few months now, and, while I would shudder to call myself an "immediate authority on artificial intelligence," I am starting to see the possibilities. I have programmed in BASIC, Logo, assembly language, and a few other odds and ends in the past, but *Prolog* is an entirely different way of dealing with the computer.

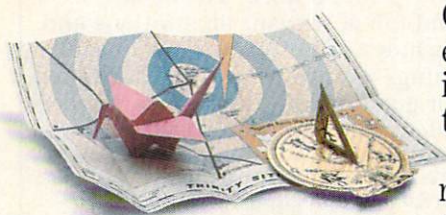
It Does Windows. Borland has

done its job well. The program writing environment is wonderful, consisting of several on-screen windows for writing, executing, and tracing programs. The language incorporates easy access to DOS functions, supports the sound and graphics capabilities of the PC, and is especially proficient at windowing. A single line of code produces handsome, on-screen windows—ready to display your text or graphics.

An MS-Dos Shoot-'em-up. If you need proof that the IBM entertainment software world is changing radically, look no further than the latest announcements from Mindscape—MS-DOS versions of *Bop 'n Wrestle* and *Infiltrator*, a helicopter shoot-'em-up, both translations of successful Commodore 64 games. The software hasn't reached my desk yet, so I can't review them for you, but I like the idea that a machine traditionally used to wrestle with business decisions is now capable of the Airplane Spin, Atomic Drop, and dreaded Reverse Suplex!

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545.606).

es. One really smells.



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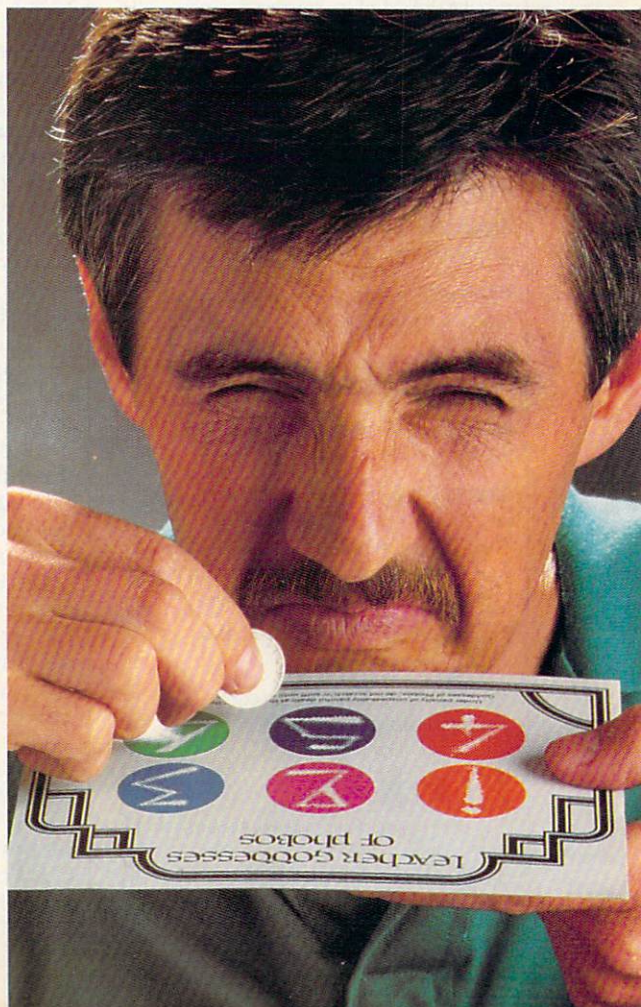
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MACHINE SPECIFICS

TANDY

BY STEVE MILLER

There's only one New Year's resolution I've ever been able to keep—to learn something new. With that in mind, I went through the latest Tandy catalog to see what might be worth learning.

With the introduction of several new IBM-compatible machines, the 1000 EX and 1000 SX, learning more than the basics about MS-DOS can be useful and fun. Unfortunately, the abridged version of the MS-DOS manual that comes with the Tandy 1000 computers—while simple and direct—is not all that helpful. *The MS-DOS/GW-BASIC Reference Guide* (Radio Shack Catalog #25-1508; \$29.95) is much more informative, better written, and better organized than IBM's reference guide. Most of Tandy's guides are written in English.

However, the *MS-DOS Manual* isn't perfect. The manual does not explain the differences between the various versions of MS-DOS (1.0, 2.1, 3.0, etc.). This lapse could cause a couple of heart-stopping surprises for the unwary. Nothing really dangerous can happen, but ERROR messages may be unsettling if you're not expecting them.

Learning BASIC. I'm not a programmer. I get really dim about the array of options available in BASIC. But that's not to say that I can't appreciate good program code when I see it or recognize a decent, basic, BASIC book.

Dr. David Lien's *Learning BASIC for Tandy 1000/2000* (Radio Shack Catalog #25-1500; \$19.95) is such a book. Lien has written a string of books about Tandy computers. The book doesn't take itself too seriously; it's full of cartoons by Bob Stevens and bad puns by Dr. Lien. But the light, chatty style belies a pile of good information.

Once you get past the basics, you can pick up more with the *GW-BASIC Reference Manual*, the companion guide to the *MS-DOS Reference Manual*. The former describes the difference between versions of GW-BASIC, yet its companion volume doesn't do the same for MS-DOS.

OS-9. For Color Computer owners who want to stretch the machine to its limits, buying and learning the OS-9 operating system is a necessary step (*OS-9 Level II*; Catalog

#26-3031; 64K and Extended BASIC required; \$79.95). OS-9 is a sophisticated operating system that allows the CoCo to imitate the programming power of much bigger and more expensive computers. You can program in C and Pascal, attach a hard-disk drive and run more than one program at a time (multitasking).

I normally distrust any book calling itself the "complete guide" to anything, because, especially in the computer world, things keep changing. I will, however, give high marks to Dale L. Puckett and Peter Dibble's *Rainbow Guide to OS-9* (Catalog #26-3190; \$16.95). It's certainly not complete, but a good guide to OS-9.

Speaking of BASIC, there's a version of BASIC especially for OS-9. *BASIC 09 Tour Guide*, by Dale Puckett (Catalog #26-3109; \$14.95), is aimed at beginning users. Puckett doesn't do a bad job here, either, but I think that in some cases he takes too much for granted.

How to Use Your Radio Shack Printer. The biggest surprise of the books I looked at was *How to Use Your Radio Shack Printer*, by William Barden, Jr. (Catalog #26-1242; \$14.95). I've always found that the most tedious and agonizing computer task was getting the printer to work properly with the computer and software, and I assumed a book about printers would be a real bore.

Guess what? It's a joy! Fascinating! For the first time, I understand how printers work. The book is clear and full of relevant illustrations and includes tips on how to do amazing things with your printer. Forgive me for gushing, but the book is wonderful—a gem you should own.

STEVE MILLER, former computer columnist for UPI, is a freelance writer and computer consultant.

ORPHANS

BY PATRICK SPERA

One thing that has always bugged me is that the power supply for the Coleco Adam is in the printer. It might have been cost-effective for Coleco, but what if the printer needs repairs? You cannot use the computer until the printer is returned from the shop! One way to get around this is to have a backup printer. You can now get one from American Design Components (62 Joseph St.,

Upcoming features in FAMILY COMPUTING

Keeping Your Computer Healthy

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Working from Home

What Makes Games Fun

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Guide to Painting Software

Getting More From Your Word Processor

Reviews of New Tandy SX and EX Computers

Original Valentine Program

Computing Family of the Year Contest

**February Issue
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January 20**

IT'S A TEXTWRITER

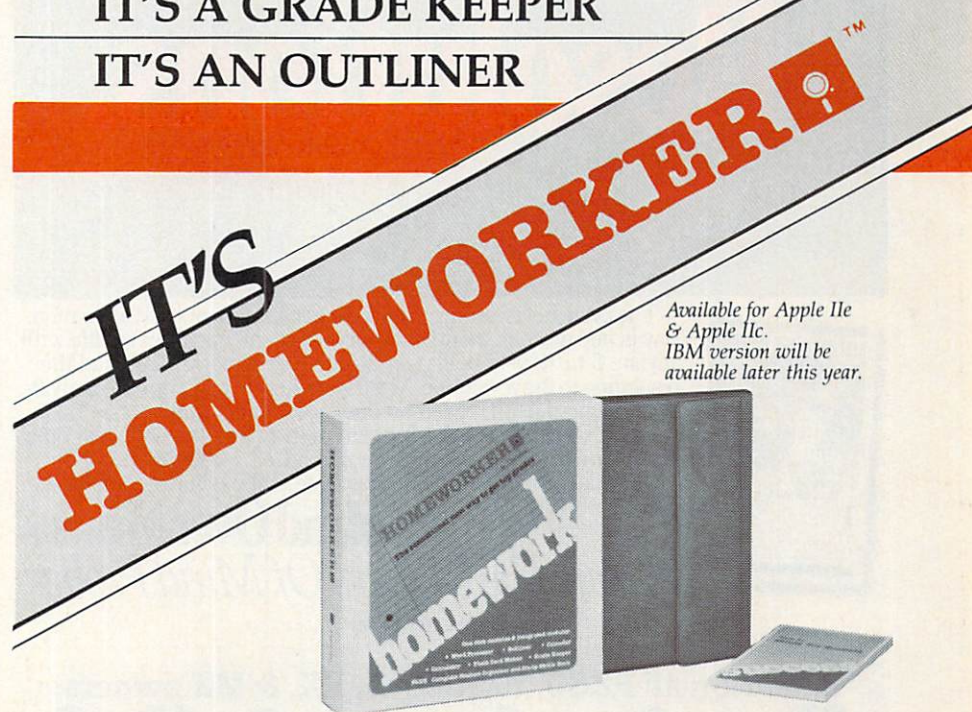
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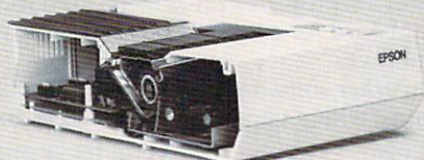
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CIRCLE READER SERVICE 19

MACHINE SPECIFICS

Moonachie, N.J. 07074; [800] 524-0809; in New Jersey, [201] 939-2710. The printer costs \$69.50, plus shipping and handling.

Mechtronics Mouse (and other neat Texas Instruments hardware)! Cynthia Becker of Brighton, Massachusetts, has an interesting line of Mechtronics hardware and firmware. The mouse is used in place of the TI joysticks and has a much better response time. Software and documentation come with it (\$98.50).

You might also be in the market for an Extended BASIC II Plus cartridge (\$79.95). Mechtronics has added 40 Graphic and 20 Call statements to the TI Extended BASIC commands. The Graphic commands include CIRCLE, TRIANGLE, SQUARE, etc. Send money orders to Cynthia Becker ([617] 782-6143), P.O. Box 275, Brighton, MA 02135, or send a self-addressed, stamped envelope for more information.

TS 2068 BASIC Compiler. Novelsoft has released a BASIC compiler, *Timachine*, for the Timex Sinclair 2068. Other compilers released for both the TS 2068 and the Sinclair Spectrum either use their own BASIC and/or work only with integer variables. *Timachine* (\$22.95) is different in that it compiles TS 2068 BASIC directly and allows for both integer and floating-point variables.

Large programs aren't much of a fuss. If the *Timachine* needs the space, it will overwrite the BASIC program as it compiles it. *Timachine* can handle a program up to 27K long. Compiled programs will take up one-third less memory and space. A program using only integer variables will RUN four times as fast.

Both TS and Spectrum versions of *Timachine* come on one cassette tape. To order or get information, contact: Novelsoft, 106 Seventh St., Toronto, Ontario, Canada, M8V-3B4; (416) 259-8682.

Flying Eagles. Eagle Microsystem Sales Inc. (EMS) still supports the Eagle line of 8-bit and 16-bit machines. EMS can repair sick Eagles, with about a 2-3 day turnaround period. EMS also runs a national users group and has an Eagle BBS ([213] 839-2264) that works at 300-, 1200- and 2400-baud.

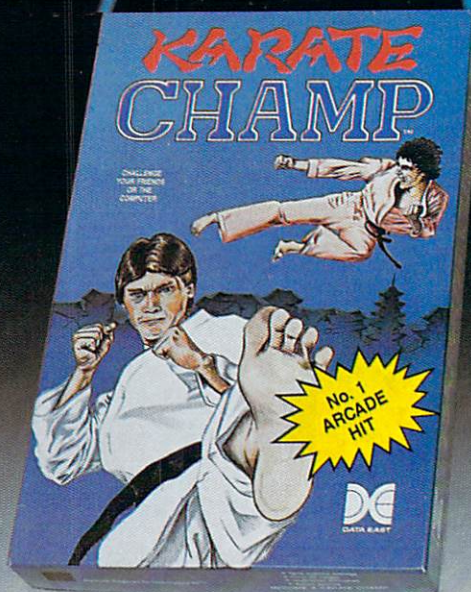
For more information call (213) 839-2263—a voice line—and ask for either Jim Toshack or Jim Roberts.

PATRICK SPERA can be reached on Compu-Serve (ID: 76703.4350).

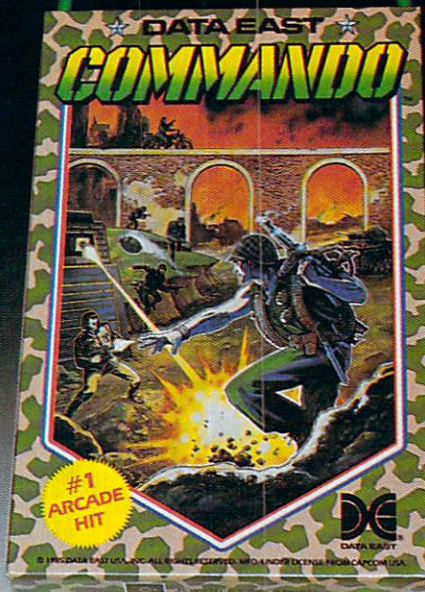
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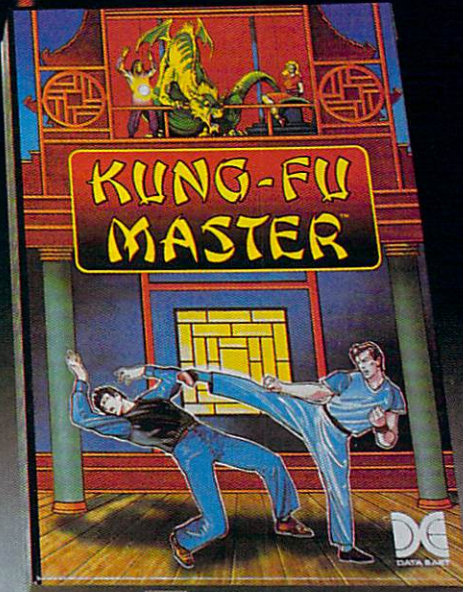
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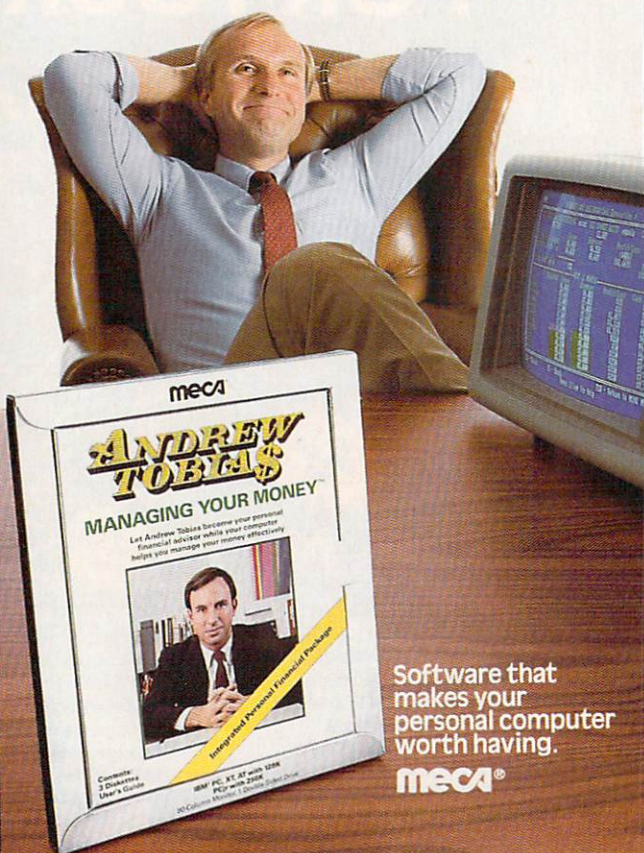
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MANAGING YOUR CHECKBOOK?
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 MANAGING YOUR TAXES?
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YOUR
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BY STEVE MORGENSTERN

O money, money, money, I am not necessarily one of those who think thee holy. But I often stop to wonder how thou canst go out so fast when thou comest in so slowly. —Ogden Nash

As this rhyme suggests, there is something positively mystical about money. Most of us know precisely where our next dollar is coming from, but where the last batch went is often baffling—and disturbing.

"I was slowly driving myself crazy because I couldn't find all my day-care receipts," says Barbara DeLong, a FAMILY COMPUTING reader who realized it was time to computerize her finances when she started doing her taxes in 1983. "I re-added and re-added, and the result was never the same twice."

But a new year is beginning! You can shake off old habits, figure out

Contributing editor STEVE MORGENSTERN uses a check-writing program and subscribes to an electronic banking service

what happens to your money, and how to keep more of it for yourself—just as Barbara DeLong did when she bought *Home Accountant* and put all her finances on her Apple II Plus.

"The computer helped me see where the money had gone, in day-care and other areas. That was a big help." Since then, she has used the program to analyze investments, including calculating the end result of different levels of IRA contributions.

John Merson, a New York computer consultant, keeps both business and personal finances with *Quicken*, a check-writing program. Summarized Merson: "I just love it; it's such a time saver. I've never kept a budget. I just pay bills and the program keeps track of the information by categories, so that at tax time I can summarize things quickly."

Geni Google, who runs a family horse farm in Rome, Georgia, uses *Sylvia Porter's Your Personal Financial Planner* to keep strict budgets. "With farm equipment

prices so high and interest rates so volatile, it helps me to budget with the computer. The budget helps me foresee my expenditures, like feed bills, having the horses shod, and other regular expenses."

If you know what you're doing, you can do much of this record keeping with nothing more than paper, pencil, and a \$10 calculator. So why do it with a computer?

A computer keeps records neat, organized, and accurate. Best of all, the records are in one place, and just a keyboard stroke away.

But the bottom line of home financial management by computer is the feeling of control you gain. Computer professionals generally refer to "power users" as businesspeople who use elaborate software systems to manage major financial transactions in the corporate world. You can be a "power user" in your own right, if you take advantage of the power of your personal computer to gain control of your money.

BUDGETING

If you can afford everything you want to buy, know what major expenses are upcoming and how you're going to pay for them, have enough money socked away for emergencies, and never find yourself gazing at the checkbook in despair at the end of the month, turn to some other page of the magazine.

Still here? I thought so. We all have some financial needs or desires that are difficult to meet. Whether your goal is to make it through the month with enough left over to save for your kid's college education, or to buy that powder-blue Porsche you've always dreamed about, budgeting is a tool to achieve these ends.

Actually, budgeting is a series of tasks you perform. First, you must track your cash flow. Where does the money come from and go to?

Next, you must assess your financial situation. What are your assets and liabilities, and what changes are needed to reach your financial goals?

Third, you must create a budget that will allow you to meet those goals. Establish spending limits by category (clothing, food, auto, etc.), and stick to those limits.

Finally, monitor your performance. Compare your actual expenses with your budgeted expenses. Make adjustments to the budget if necessary to reflect changes in your situation or variations from your expectations. And continue to compare actual figures to budgeted amounts.

HOW YOUR COMPUTER HELPS

Home financial management software makes keeping a budget easier in several ways. It provides a framework for you to enter your figures and organize them. Each software package comes with established budget categories built in. You have the option of deleting some of these categories and adding more of your own. The package also includes some system for adding figures to date and comparing them with budgets.

Many programs even provide a graphing capability so you can see in businesslike bar graphs or pie charts the state of the family finances.

A computerized budget has neatness on its side. When it performs hundreds of financial transactions over the course of months or years, neatness will really make a difference. There are no erasures, strikeouts, or sheets that come loose from

the binder with a computerized budget. The columns stay lined up, and the addition is sure to be correct.

More important, the information can be sorted and reported in lots of meaningful ways, without requiring you to manually extract the appropriate data. Want to know how much you spent on utilities? How much you spent on each individual utility? How the bills compared to your origi-

nal expectations, or budget?

From the file of information you create as you enter your bill payments each month, the program will create reports in a wide variety of permutations and combinations.

Let the computer act as an impartial observer, a referee that tells you when you're overspending. Maybe that will be the goad to help you reach your goal.

THE BEAUTY OF A BUDGET

WITH A COMPUTERIZED BUDGET,
THE KING FAMILY CUT THEIR LOSSES
(AND THEIR CREDIT CARDS)



Cheryl and George King of Claremont, California, knew they were in trouble. "We had things happen to us—unexpected things that put us behind the 8-ball," said Cheryl. "Neither one of the births of our children was covered by insurance. We had a truck blow up on us—a brand-new truck, and had to buy a second-hand car for transportation while we were fighting the car company. And once you get behind, it's easy to use your credit card."

The Kings built up substantial balances on four major charge cards, and then found it increasingly difficult to meet the payments every month. "We knew that when we sent out the bills every month, there wasn't enough money to cover all the payments. But it really took sitting down with the computer to add up all the different loans we had out, the credit cards, and the electric and water bills."

"I think that the first time we ever even approached the problem in a really logical way was with the computer. When we saw what was happening with the bills, we could then try to correct the problem. But until we got all the information on the computer, we had no idea that we had amassed the amount of debt that we had."

ESTABLISHING A BUDGET

When the Kings first bought an Apple IIc, Cheryl took on the responsibility of computerizing the family finances. She bought *Dollars and Sense* and began entering the figures. "First, I listed all my bills. A program within *Dollars and Sense* writes checks for you and keeps a running tab of your balance. Another program provides a monthly budget of what you're spending by category, so you become very aware of where you're spending."

"One thing that makes the computer really helpful is that we have money coming in from three different sources. My husband has his teaching salary, and I make money teaching, too. My husband also started a side business with insurance. So he gets paid on the first of the month, I get paid on the tenth of the month, and then his insurance checks can come in at any time.

"That makes keeping a budget difficult, because the amount that comes in from the insurance always varies, and my check can vary also. So George sits down at the computer and pays the bulk of the bills on the first of the month with that first paycheck, then goes back mid-month and recalculates where we stand."

"This kind of tracking helped us figure out where we could cut and where we had to tighten the belt to get squared away."

One of the first things to be "cut" was their stack of credit cards. "Yes, we physically cut them up. We kept one credit card for ID purposes, but we never use it to buy anything."

TACKLING TAXES

With the computer helping them to keep track of their progress, the Kings have subdued the monstrous credit-card balances. "Fortunately, we have almost totally recovered from that—we're close. When you have a computer, you don't have to sit down with your calculator for hours and hours."

After computerizing their financial life with a budgeting program, the Kings bought a tax program as well and used their computerized records to prepare their return. "It seems that if you're audited once, it becomes a repeat thing. We were audited about seven or eight years ago. There were no changes, but still we've been audited about four times since then. We almost expect to be audited, so we have to keep extremely accurate records. The computer has been a big help in that area."

Some people assume that using a computer to manage your financial life is mainly for families with intricate financial affairs or individuals with a head for figures. The Kings would disagree.

"We're not really great financial geniuses," Cheryl King flatly admits. "Neither one of us is strongly organized, especially financially. It was very hard for us to manage our finances without a computer. We just weren't keeping accurate records. We're not strong in that area, so a computer is a godsend."

Net Annual Budget Balance: 9,540.00

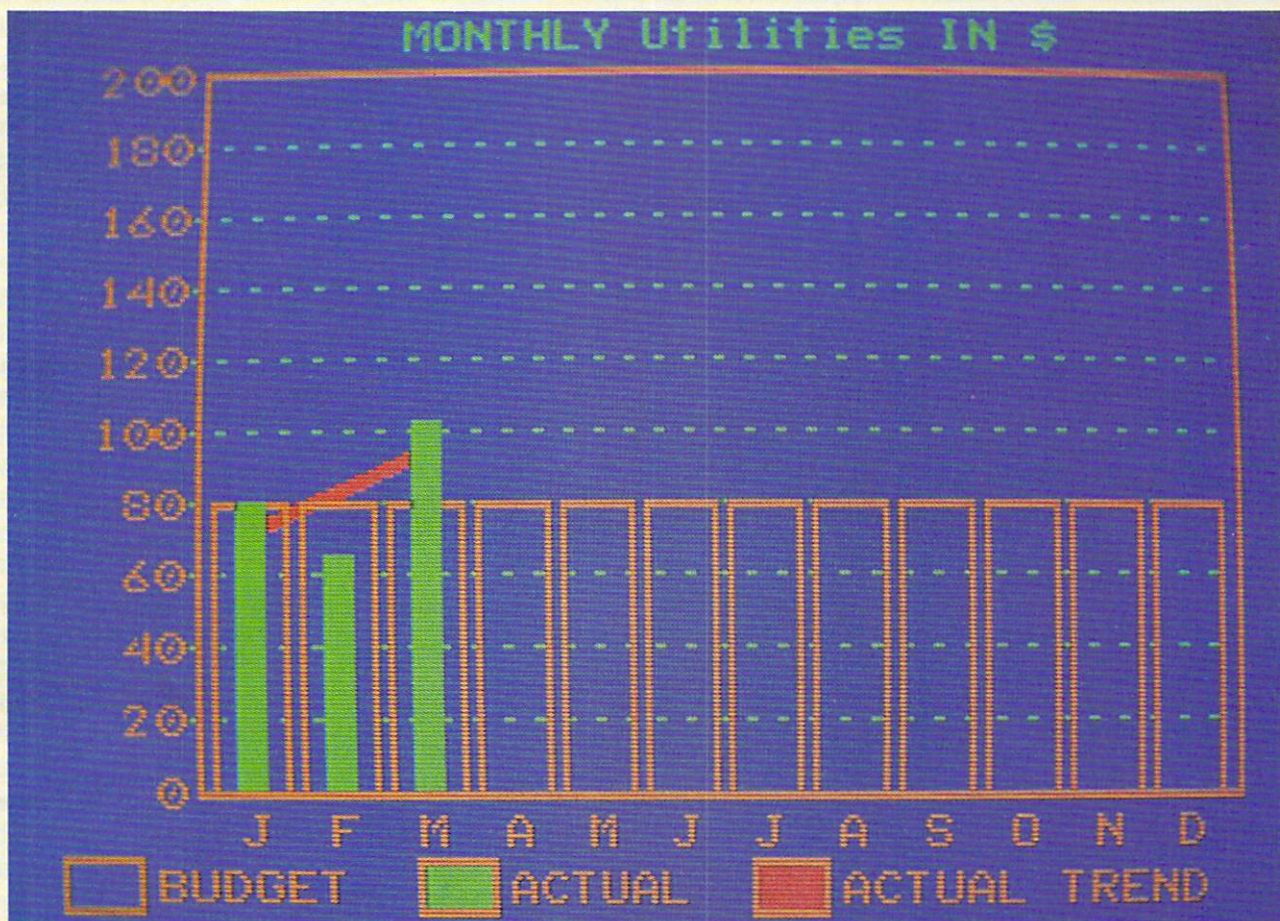
Press Alt-Quit, New, Remove/Restore, FirstPg, LastPg, Opt

ACCOUNT NAME	TYPE	START BALANCE	MONTHLY BUDGET	MONTHLY ACTUAL	MONTHLY VARIABLE
100 Personal Checking	Check	500.00	0.00		
200 Cash	Asset	120.00	0.00		
201 Savings Account	Asset	1,224.45	0.00		
202 Stocks & Bonds	Asset	0.00	0.00		
203 Home	Asset	110,000.00	0.00		
300 Mortgage	Liability	80,000.00	0.00	Jan 1,500.00	
301 Loans	Liability	0.00	0.00	Feb 0.00	
302 Credit Cards	Liability	4,000.00	0.00	Mar 0.00	
400 Paycheck	Income	0.00	3,700.00	Apr 0.00	
401 Interest Income	Income	0.00	70.00	May 0.00	
402 Dividends	Income	0.00	45.00	Jun 0.00	
403 Check Interest	Income	0.00	0.00	Jul 1,500.00	
500 Mortgage Interest	Expense	0.00	600.00	Aug 0.00	
501 Loan Interest	Expense	0.00	210.00	Sep 0.00	
502 Taxes - Federal	Expense	0.00	1,000.00	Oct 0.00	
503 Taxes - State	Expense	0.00	223.00	Nov 0.00	
504 FICA	Expense	0.00	450.00	Dec 0.00	
505 Taxes - Property	Expense	0.00	[Variable]		
506 Medical/Dental	Expense	0.00	50.00		
507 Auto Expenses	Expense	0.00	140.00		
508 Utilities	Expense	0.00	97.00		

[Check] Home Credit Cards Check Interest
Personal Checking Savings Account Loans Dividends
[Asset] Stocks & Bonds Mortgage Interest Income
Cash [Liability] [Income] Paycheck

Edit Transactions Personal Checking Balance: 2,937.05
Press Alt-Quit, New, Insert, Remove/Restore, FirstPg, LastPg, Opt, Accts

DATE	TRANSACTION DESCRIPTION	DIST. ACCOUNT	CHECK(ES)	DEPOSIT(ES)
01/01	January paycheck			2,517.00
	Paycheck	T	3,700.00	
	Taxes - Federal	T		740.00
	Taxes - State	T		110.00
	FICA	T		333.00
01/11	Electric Power & Light	Utilities		79.95



BUDGETING

1. The first step in using a budgeting program (*Dollars and Sense* is shown here) is to create a list of accounts. These include not only bank accounts, but loans and credit cards, investments, utilities, and any other category you want to track.

Once you've done that, you enter the amount you want to budget for each income and expense category, based on your plans and prior experience. If the expense is a

steady amount, you can enter a figure in the MONTHLY BUDGET column. You can also create categories that vary month to month by setting up a VARIABLE BUDGET entry, and listing the appropriate figures for each month (right-hand column).

2. On the screen used to record activity in a checking account, we have recorded two transactions: a paycheck deposit, and then a payment to a utility company.

At the top of the screen are the accounts previously entered into the budgeting system. The headings in the highlighted line are as follows: CLR for Cleared, used in balancing the account with your statement, check number and date; TRANSACTION for the name of the source of a deposit or recipient of a check; DIST ACCOUNT for the budget category under which the transaction should be filed; T for identifying tax-related transac-

tions; and columns for the amounts of checks or deposits.

Note that the single paycheck deposit has been split into several categories for budgeting purposes.

3. You can view seven different kinds of "reports" with *Dollars and Sense* and print them out if you wish. Here we have selected a balance sheet showing our budgeted spending by month for utilities, versus our actual spending. The red line tracks the spending trend.

CHECK WRITING

When computers were first being promoted for home use, one of the chores most frequently mentioned as an appropriate task was balancing the family checkbook. Like many promises made at that time, checkbook balancing failed to deliver convenience or practical value. Entering all that information at the computer keyboard just for the sake of having the computer do some addition and subtraction was silly.

Then why are we writing about computerized checkbooks now? Because checking software available today really does make computerizing your checkbook a worthwhile move. These programs do more than just reconcile your checkbook with your monthly bank statement. Whether you buy a stand-alone checking management program, or use the checking section of a multipurpose financial management package, you'll be able to do the following:

- Print actual checks, ready for mailing, on your system printer.
- Precode regular check payments so that the recipient's name and address and the amount to be paid will be entered automatically.
- Watch information entered when writing the check automatically car-

ried over into your checking register.

- Retrieve information from your checkbook to summarize payments made, selected by payee, or budget categories you set up.

- Share information with other financial management functions, such as tax management, long-term budgeting, saving, etc.

SET UP A ROUTINE

Using the computer to print out checks is only practical if your bill-paying routine is systematic. It simply isn't worth the trouble to take out the regular paper from your printer and load in the checks if you only plan to pay one or two bills. Instead, set aside one or two times a month for bill paying and take care of a batch at a time.

If you're set up properly, paying checks by computer can be advantageous. Even the process of writing the check can be streamlined by the software. When you fill in the figures for the amount line of the check, the program will automatically write in the text line. For instance, if you enter "42.57" after the dollar sign, the written amount line is automatically entered as "Forty-two and 57/100*****" with enough asterisks to

fill out the line to prevent tampering.

Regular check payments are even easier. Your mortgage or rent payment is the same every month. With check-writing software, it's a simple matter to save all the information needed to fill in regular expense checks, save it to disk, and recall it when needed to instantly fill in the entire check.

Documentation for the software you use will suggest sources for checks that will fit in your printer. The checks are designed from a copy of your bank checks, with all the same information. Five hundred checks cost about \$30.

Many mail-order supply companies offer checks customized to work with check-writing software. You can also order window envelopes which let the address of the recipient show through, eliminating the extra step of addressing an envelope.

AN AUTOMATIC RECORD

A key advantage of using check-writing software is the way information is automatically carried over into a computerized checkbook register. How many times have you written a check and forgotten to enter it in the register, or carried over the wrong

10 TIPS FOR SUCCESSFUL BUDGETING

1. Start by keeping track of virtually every nickel and dime you spend. One of the key goals of budgeting is to find the leaks in your finances, and there are usually important surprises when you start accounting for each dollar as it leaves your hand. Did you really spend \$30 last month on magazines? How could the family have spent \$42 on video rentals?

2. Write it down! From the first day you start building a budget, write down where the money goes as you spend it. Keep a notepad in your pocket. Keep receipts, and make notes on the backs of them to indicate what the figures printed there actually represent.

3. Unless you live by yourself, budgeting is an intensely political process and a highly emotional one. At this stage, your family is running like a small company with many departments, and none of them is going to be very happy seeing his or her budget cut. Make a fair and reasonable budget.

4. It takes cooperation to devise a successful budget—but it takes only one person to keep the records up to date. Entering figures into the computer should be the designated responsibility of a single family member. The most successful budgeters we spoke with each had a single

budgetmaster at the keyboard, who gathered information and entered it in an orderly fashion.

5. A single budget may not work in your household. Maybe you have more than one income, and each bread earner wants to control his or her own money. Maybe you want to maintain separate financial lives while meeting joint goals. No problem! Just set up separate budgets. The main thing is to agree on how much each person will contribute to the common expenses, such as rent or mortgage, utilities, and property taxes.

6. Any budget must include allowances for an individual's unspecified expenses. It is tough enough to keep to a budget without having to account for every 50-cent chocolate bar you consume. Having a budget category for "mad money" or "bad money" relieves some of the pressure of living within a budget.

7. Figure out what your actual expenses were in the past and base your budgeted amounts on the historical record. If there is a predictable trend in these figures—regular rent hikes or rising electric rates, for example—include estimated increases in your budget figures.

Look ahead at major expenses that are fairly predictable. How long can you rea-

sonably expect your current car or the roof on your house to last? When you want to go on vacation, how much will it cost, and how many months do you have to save that amount? Who is going to college when, and how much will that cost?

8. Don't try to update the figures in your computer every time an expense arises. Instead, keep a folder by the computer with the necessary information—receipts, notes, check stubs, deposit slips, etc.—and set a regular interval for entering the information.

9. Set regular intervals for evaluating the results of your budgeting, as well. At the agreed-upon time you can print out copies of reports from the program, congratulate yourself on your successes, assess your shortcomings, and decide on any adjustments needed to meet your goals.

10. Many people find that it helps to "live out of the checkbook" as much as possible. Most of your major expenses are probably paid by check already. If you make a habit of paying for groceries by check as well, or writing checks for clothing purchases, train tickets, or other transactions you now handle on a cash basis, you will have a better source of financial information in a single place.

Current Balance:\$2,747.22 WRITE CHECKS ESCAPE:Main Menu

3/18 1987

PAY TO THE ORDER OF FC Power and Light Co. \$ 72.43

Seventy-Two and 43/100***** DOLLARS

ADDRESS

MEMO utility

Copyright (C) 1985 Intuit

APPLE-RETURN to record check, APPLE-P to print checks APPLE-? for help

CHECKWRITING

1. The checkwriting screen (*Quick- en, Apple II version*) presents us with a blank check on-screen, ready to fill out. By moving around the screen with cursor and TAB keys, we have entered the necessary information for a check to the electric company. We have included the word **UTILITY** on the memo line to help produce a sorted report later. The **CURRENT BALANCE** line at the top of the screen will be updated as we write each check.

With special continuous-form checks in our printer, we can print out a check. Ideally, you'd pay a number of checks at one time, rather than loading checks into your printer just to make one payment.

2. The on-screen check register looks almost exactly like the checkbook you're probably using now. Note that the check we just wrote has been entered in the register, although we do have to enter the check number in the appropriate column (now filled with asterisks). Some programs number checks in the register automatically.

3. The search request screen allows us to specify the time period, payee, and/or memo notation for which we are looking. In this case, we have asked for all the utility payments made from the beginning of the year through March.

4. This is not a *Quick- en* screen—it is an *AppleWorks* spreadsheet set up for a family budget. We have used the **TRANSFER DATA TO APPLEWORKS** function of *Quick- en* to move our checking account figures into the appropriate budget categories.

CHECK REGISTER

ESCAPE:Main Menu

DATE	NUM	TRANSACTION	PAYMENT	DEPOSIT	BALANCE
2/27 1987	108	Dr. Victor Frankenstein MEMO:medical	40.00		1,767.22
3/1 1987		Deposit MEMO:Ward's paycheck		1,920.00	3,687.22
3/18 1987	109	Big Bucks Savings & Loan MEMO:mortgage	940.00		2,747.22
3/18 1987	*****	FC Power and Light Co. MEMO:utility	72.43		2,674.79
3/18 1987		MEMO:			
		BOTTOM			

APPLE-RETURN to record items

APPLE-? for help

SEARCH REQUEST

ESCAPE:Main Menu

Main Menu

Search Request

Search from 1/1 1987 to 3/18 1987

for all transactions in which

Payee contains

and Memo contains utility

APPLE-RETURN to start search

APPLE-? for help

File: ourbucks REVIEW/ADD/CHANGE Escape: Main Menu

	dC1/87	dC2/87	dC3/87	dC4/87
1				
2				
3				
4				
5				
6	m[paycheck]	INCOME	\$3,840.00	\$3,840.00
7				
8				
9				
10				
11	m[mortgage]		\$940.00	\$940.00
12	m[medical]		\$40.00	\$40.00
13	m[utility]		\$105.08	\$105.08
14				
15				
16				
17				
18				

E13: (Value, Layout-02) 75.59

Type entry or use commands

Apple-? for help

figure from the check to the checkbook? That source of confusion is eliminated, along with the messy scrawls and illegible scratches typical of my handwritten checkbook entries. And figures are placed in neat columns with addition and subtraction accomplished automatically.

Do you have to print out all your checks on the computer if you're using a check-writing program? Absolutely not. The on-screen check register is nearly identical to the paper register you are now using, and you simply add in listings for any checks you write by hand, along with deposits, bank fees, automatic teller withdrawals, and other transactions.

In fact, even if you don't want the computer to print out your checks at all, checkbook-management software can still be worthwhile for its organizational and reporting capabilities. And that starts with the mundane task of balancing your checkbook.

Balancing a checkbook by computer is far simpler than doing the job by

hand. When you receive your statement, simply boot up your checkbook program and check off the items that have cleared, and then enter the closing balance the bank indicates. The computer will do the math, making allowances for checks that have not yet cleared, and tell you whether your version of your financial status agrees with the bank's, or how far apart you are.

USING THE INFORMATION

Writing checks with your computer is convenient, but its real value is to capture your financial information and analyze it in meaningful ways. You can set up tax-deductible categories, so at tax time you can get a full accounting of every penny spent in each category. At year's end, you can see how much you spent in various budget categories. Thus, if you try to live by your own budgets, you can set next year's budget accordingly.

In effect, your checkbook becomes a mini data base, with convenient

searching and reporting functions at your fingertips.

If you want to engage in more sophisticated financial management, you may be able to transfer information from your checking records to other software. Programs such as *Quicken*, which is strictly a checking management program, can transfer information directly into selected spreadsheet programs. For example, *Quicken* will automatically transfer figures into an *AppleWorks* or *Lotus' 1-2-3* spreadsheet constructed to *Quicken* guidelines. You could use the spreadsheet to set up budget categories or otherwise analyze your spending habits.

In a more comprehensive financial management package such as *Managing Your Money* or *Sylvia Porter's Your Personal Financial Planner*, the information entered into the checkbook program is automatically used in other sections of the program to calculate your budget, your net worth, and other related functions.

ELECTRONIC BANKING

It's 10 p.m.—do you know where your money is?

Thanks to electronic-banking services, it's now "banker's hours" around-the-clock. By calling the bank with your modem-equipped personal computer, you can get an up-to-the-minute picture of your bank accounts at any time of day or night. If you or the bank makes a mistake, you don't have to wait until the end of the month to get a statement in the mail.

With electronic banking, getting information about your accounts is easy and convenient. So is performing transactions. In fact, if you have a "direct deposit" arrangement with your employer, the only time you'll have to go to the bank is to get cash. Everything else can be done from your home.

You can move money between savings and checking accounts and even dip into credit-card cash advances. This lets you keep money in an interest-bearing account as long as possible, and then transfer the funds to cover checks when you write them, without making an extra trip to the bank.

My own use of this transfer capability helped build a modest savings plan. Every Monday, like clockwork, I log on to my electronic-banking service and transfer \$50 into my savings

account. I don't have to go to the bank and make a savings deposit. I don't see the money in my hands, tempting me to spend it. I could even set up my account to perform this transaction automatically. Slowly but surely, my savings grow, thanks to electronic banking.

You can also pay bills. You set up a list of the merchants, utilities, installment loans, and credit cards you'd like to pay electronically. (Your bank will give you a list of the creditors who will accept electronic payments.) Then, when you want to pay your bills, you select these creditors from the list, and, by filling in an on-screen form, ask the bank to pay them. Surprisingly, these payments are generally not handled as electronic funds transfers; the bank prints out a physical check and mails it. Writing a check yourself and dropping it in the mail may be actually faster!

Also, the money is deducted from your account when the check is sent—so you lose the two- or three-day "float" you're accustomed to.

You pay a monthly fee for using the electronic-banking service (usually \$8-\$12), and you pay for the phone bills (usually local) while you're connected. However, you don't pay connect charges for the time you spend on-line.

ELECTRONIC BANKING ADVANTAGES

What are the potential advantages of electronic banking? You can schedule in advance bill payments for the entire month or even input regular payments to take place on a certain date every month until you stop the procedure.

If your electronic-banking service is tied in to a financial management program, which is unfortunately the exception rather than the rule, you can put together your payments offline, then call the bank and send all the payments you want made. Thus, you have records of all transactions.

The new edition of *Andrew Tobias' Managing Your Money* features the ability to exchange information with the Chase Manhattan Bank's Spectrum electronic-banking system. Bank of America and Citibank offer a similar information-sharing scheme with *Dollars and Sense*. If you use one of these programs and the cooperating bank, electronic bill-paying becomes a practical matter.

Another potential benefit offered by some home banking services is online budgeting. Much like the budgeting capabilities of financial management software packages, this feature allows you to set up budget categories. When you pay bills, you assign payments to these categories and

WELCOME TO TARGET NETWORK

FOR ASSISTANCE CALL PRONTO CUSTOMER SERVICE AT 1-800-832-4100

Please enter your access codes.

TARGET ID: ■

Code Name:

Password: ■■■■■■

Use TAB to move between items.
Press RETURN when complete.

TARGET-> PRONTO FROM CHEMICAL BANK MENU

- 1 Account Information
- 2 Funds Transfer
- 3 Bill Paying
- 4 Recordkeeping
- 5 Self-Service Banking Center
- 6 MONEY Online
- 7 Consumer Information

Enter item # and press RETURN: ■

>>

TARGET-> PRONTO FROM CHEMICAL BANK BALANCE INQUIRY

REGULAR CHECKING 100000001000713
Through 10/16/86 - Updated

1	Checking Available	2500.00
2	Ovdfit Chk Available	500.00
3	Total Available	3000.00
4	Gross Balance	2900.00
5	Outstanding Checks	85.00
	Checkbook Balance	2415.00
6	Payments Next 90 Days	2430.00
7	Transfers In Today	600.00

Enter item # and press RETURN: ■

>>

TARGET-> PRONTO FROM CHEMICAL BANK STATEMENT ACTIVITY

REGULAR	CHK	100000001000713
Balance	09/01/86	1,000.00
Balance	10/16/86	2,500.00
09/01	PMT DWELLING MGRS	550.00
09/01	PMT INSTALL. LOAN	160.00
09/06	PMT SHORE OIL	50.00
09/06	AMERICAN EXPRESS	220.00
09/07	SALARY DEPOSIT	1,000.00
09/08	TRF TO CHECKING	500.00
09/09	CHECK 242	490.00
09/12	DEPOSIT	600.00
09/15	PMT TO MASTERCARD	265.00
* 09/17	CHECK 244	45.00
09/18	CREDIT MEMO	800.00
09/19	EFTS DEBIT(w/drl)	120.00

Press RETURN to continue list.
*Indicates bank entered item.

>> ■

ELECTRONIC BANKING

1. Shown here is the sign-on screen for the Target Network, which includes Chemical Bank's Pronto home-banking service. To access the system you need special software, provided to subscribers, which sends a set of codes to the bank's computer when connection is established. To access your individual account you use a secret **PASSWORD**.

2. The main banking menu (the Target Network includes other services) indicates the options available through home banking. The **RECORD KEEPING** option lets you keep an on-line check register. The **BILL PAYING** option allows you to designate a spending category for each check you write, and have the amount automatically added to your running total in that category.

The **SELF-SERVICE BANKING CENTER** offers a variety of functions. You can add merchants and creditors to your bill-paying list (the bank will give you a list of institutions that will accept electronic payments), get information about

bank services, and use the **Money Manager** section to analyze investments.

MONEY on-line contains article excerpts from *Money* magazine, and **CONSUMER INFORMATION** includes articles from *Taxlines* and *Consumer Reports*.

3. Requesting an **ACCOUNT BALANCE** brings up a summary of your financial status—much as you'd get from an electronic 24-hour banking center. If you want more information, the **ACCOUNT DETAIL** screen is available.

4. For a full picture of account activity for the previous and/or current month, we request an **ELECTRONIC STATEMENT**. Here we have specified the statement starting date and received a complete statement, similar to the printed month-end statement we'll receive in the mail. But it's up-to-date as of the close of the previous day.

This information is valuable if you often juggle money between accounts to cover checks or to get higher interest rates in *Money Market* accounts.

your budget will be kept up to date. Then, when you receive your monthly statement in the mail, your monthly and year-to-date budget results are included. And, you can check your budget on-line at any time.

In addition, more and more banks

allow customers to conduct major financial transactions on-line—buying and selling stocks, bonds and certificates of deposit, opening or adding to an IRA, and so on.

With only about 100,000 customers nationwide, electronic banking is

not widespread right now. And, it's pretty much limited to big-city banks. But, as the big-city banks refine their systems and license them to smaller banks, you can expect to see more and more banks advertising to gain electronic customers.

INVESTING

Investing is not all "Wall Street." It includes a wide range of personal financial decisions. Beyond buying stocks and bonds and Treasury bills, investing is deciding which home mortgage, retirement account, or insurance policy to buy. In short, you don't have to be rich to invest.

And whether your investment activity involves simple deposits in interest-bearing accounts or complex stock trades, your computer can help make your planning more productive and your records more reliable.

Many personal finance programs have portfolio management sections that allow you to keep complete records of all your assets and monitor their performance as interest rates and dividends change. Some programs have financial planning sections that let you make future projections. Want to know how much you'll have to save each year at a given interest rate and a given inflation rate to have \$50,000 by the time you retire? Fill in the figures and let the computer calculate.

Investors who play the markets might use specialized software that is designed to analyze corporate and stock market data.

In general, your computer can help

you manage and plan your investments in three ways:

- Gather information to decide what to do with your money
- Analyze that information
- Keep records of your investment portfolio

GATHER INFORMATION

The information-gathering function of personal computers is especially appealing to those who make their own decisions and don't rely on brokers. By calling an on-line information service (Dow Jones News/Retrieval and CompuServe have the most financial information) with a modem-equipped computer, investors can acquire both up-to-the-minute price quotes and historical information on virtually any potential investment. While financial software can then be used to analyze the information, knowledgeable investors may be able to draw their own conclusions directly from the data.

Standard & Poor's, Value Line, Moody's, Media General, and other well-known corporate tracking companies have their data on-line. And some even sell it on disk. For instance, Standard & Poor's *Stockpak II*, which provides stock information

that you can use for trend analysis, comes on disk, updated monthly.

On CompuServe, you can keep an up-to-date listing of virtually all mutual funds that are offered, what they specialize in, and past and current rates of return, etc.

On Dow Jones News/Retrieval, you can read business news from the Associated Press, *The Washington Post*, *The Wall Street Journal*, and *Baron's*. Thus, if you're tracking a stock, you can find out all about its past market performance and corporate performance—and what the newspapers have said about both.

Then, you can place buy or sell orders through discount brokerage services on Dow Jones News/Retrieval, CompuServe, or The Source.

PLAN FOR YOUR FUTURE

For the same reason a computer is perfect for analyzing your own financial data, it is perfect for analyzing reams of corporate, stock market, and interest rate data. A computer is not overwhelmed by lots of numbers, or big numbers.

If you are the type of person who puts your money into savings accounts, Certificates of Deposit (CDs), or other investments that offer a pre-

TERMS OF ENRICHMENT

Assets: Everything of value that you own—including cash and property that can be converted into money.

Balance Sheet: A summary report of your financial status. One side lists what you own; the other lists what you owe.

Credit: In the bookkeeping sense, a credit is an amount added to an account (such as income).

Debit: The opposite of a credit, a debit is a deduction from an account.

Equity: The value of a property you own, above and beyond any debts you owe against it. For example, the equity you have in your home is the value of the house minus the current balance of your mortgage and any other home loans.

Liabilities: The opposite of assets, liabilities are debts of all sorts.

Liquid Assets: Those assets that are in the form of cash, or that can easily be converted into cash. (Stocks or mutual funds are liquid as opposed to real estate or a car, which would take time to sell.)

Net Worth: The total value of all your assets, minus your liabilities.

Reconcile: To compare your own records with those of an outside source and iron out the differences. To balance your checkbook against your monthly statement, or compare your credit card statement against the receipts you saved.

Transaction: In the financial sense, any dealing in which money changes hands or debt is incurred.

One moment please...

These quotes are delayed a minimum of 20 minutes and cover several major U.S. exchanges as well as selected OTC. CompuServe does not edit this data and is not responsible or liable for its content, completeness, or timeliness.

Enter one or more ticker symbols (ie. HRB, IBM), or /H for capabilities.

Issue: SCHL

Name	Volume	Hi/Ask	Low/Bid	Last	Change	Update
SCHOLASTIC INC	10	31.250	31.250	31.250	0.250	0:00

Issue: I

INVESTING

With a modem and a subscription to an information service, you can access a variety of financial data virtually any time of day or night.

Here, we check the stock activity for Scholastic Inc. on CompuServe. The price is given, with a delay of 20 minutes.

dictable yield over a period of time, your computer can calculate the actual yield you will receive on your money once compound interest and inflation rates are taken into account. Many integrated money-management programs include sections that allow you to simply fill in the blanks and have this analysis performed automatically.

Any finance program with a portfolio management section will automatically compute the value of your holdings, at today's prices (you have to enter the prices!). Key dates in the history of an investment, such as the expiration date of a CD, can also be recalled quickly with a program.

Heavy stock market traders usually subscribe to one or two types of analysis. Fundamental analysis tries to

identify desirable stocks based on certain performance criteria and general industry trends. Much of the data you gather on-line can be charted to get a picture of a company's "fundamental" position.

Technical analysis, based on the movement of a stock, relies on charting changes in trading volume and price data to predict future market activity. Technical analysis software (such as Dow Jones' *Market Analyzer PLUS*) will take the numbers you have collected on-line and run any number of checks on them. The graphing capabilities of the computer are especially important to technical analysts, who can produce and print out charts in a fraction of the time needed to accomplish the same task by hand.

PROS AND CONS

When does it *not* make sense to start tracking investments by computer? When you know you won't take the time to continually update your portfolio. When all your money is in one spot—with a bank, or brokerage firm—that sends you a complete monthly report. Or when you think you'd spend more money watching your money than you'd make.

But, if you're using the computer for check writing or budgeting, it may make sense to track your portfolio as well. Having a record of all your assets and liabilities in one place (especially a place that you visit often) will give you more control over your money. That is always reassuring and sometimes profitable. **RE**

PERSONAL FINANCE SOFTWARE

BUDGETING SOFTWARE

Andrew Tobias' *Managing Your Money* \$199

MECA; (203) 222-1000
128K Apple IIe/Ic; 128K IBM PC; 256K PCjr; PCjr cartridge version available from IBM

Complete integrated financial management program that is powerful and easy to use. Includes budgeting, check writing, transaction tracking, insurance, real estate, stocks, tax estimation and financial analysis sections. The best program of its kind. Latest IBM version (3.0) allows on-line tie-in to Chase Manhattan Bank's electronic banking system.

Dollars and Sense \$99-\$180

Monogram; (213) 215-0529
48K Apple II; 128K IBM PC/PCjr; Macintosh

Powerful and complete, but can be difficult to master. Allows portfolio management and tax forecasting. Integrates with Bank of America's HomeBanking and Citibank's Direct Access electronic-banking systems.

Home Accountant \$75-\$150

Haba/Arrays; (818) 994-1899
48K Apple II; 48K Atari XE/XL; Atari ST; C 64/128; 128K IBM PC/PCjr; Macintosh; Expanded version for 128K Apple IIe/Ic; Plus version for 128K IBM PC

Complete budget program, but setup can be tedious; includes some financial counseling. Capable of printing checks, flagging tax-deductible expenditures, and graphing.

Home Money Manager \$60

Nickelodeon Software
(503) 692-3732
IBM PC and compatibles
A checkbook/budget program for home users. Up to 60 budget categories. The program is entirely menu driven.

It Figures \$40

SimpliSoft Products, Inc.; (303) 444-8771

128K Apple IIe/Ic; 128K IBM PC/PCjr

Somewhere between an electronic calculator and a full-fledged spreadsheet, this easy-to-use program can help analyze financial decisions such as the effects of refinancing your home, increasing your savings rate, or accelerating tax deductions.

J.K. Lasser's *Your Money Manager*

\$69-\$100
Simon & Schuster; (212) 333-5800

128K Apple II series; IBM PC/PCjr; Macintosh; Commodore 64/128

A financial management program that helps keep track of assets and liabilities, income, and expenses. Prints reports and graphs and information for companion *Your Income Tax* program.

On Balance \$99

Broderbund; (415) 479-1700

128K Apple IIe/Ic/GS
A new money management program that allows you to create up to 175 accounts. Tax-related expenditures can be flagged for easy recall. One disk can hold a year's worth of financial transactions. Monthly and annual budgets can be set.

Personal Finance II \$30

Tandy; (817) 338-2395

Color Computer II/III
Set up a personal or household budget with 26 major expense categories, including auto, gas, clothing, food, retirement. You can review your expenditures on a year-to-date or category basis.

Quicken \$49

Intuit, Inc.; (415) 322-0590
128K Apple IIe/Ic/GS; 192K IBM PC/PCjr

Essentially an electronic checkbook. Prints checks, and retrieves spending information by payee or category.

Smart Money \$80

Sierra On-Line, Inc.; (209) 683-6858

128K Apple IIe/Ic; 128K IBM PC/PCjr

A relatively easy-to-use program that supports budgeting and check writing/printing, produces transaction reports, balance sheets, and profit-and-loss statements, plus bar graphs. Handles loan amortization, compound interest, and annuity calculations.

Sylvia Porter's *Your Personal Financial Planner* \$50-\$100

Timeworks; (312) 948-9200

128K Apple IIe/Ic; Atari ST; C 64/128; 128K IBM PC/PCjr; Macintosh

A complete program with clear documentation and excellent financial planning section. You can write checks, maintain a budget, track cash and credit expenditures, and project your financial needs.

Time Is Money \$100-\$125

Turning Point Software; (617) 782-4877

64K Apple II; 128K IBM PC/PCjr

Powerful budget program that is very easy to set up and use. IBM is not copy-protected.

INVESTMENT SOFTWARE

The Equalizer \$199

Charles Schwab & Co., Inc.; (415) 627-7197

128K Apple IIe/Ic; 128K IBM PC; modem required

A home-brokerage software package with communications ability that combines trading, research, and record keeping. Links you to discount broker Schwab's computer system for transactions.

The Isgur Portfolio System \$200-\$250

Batteries Included; (416) 881-9941

Atari ST; 512K IBM PC; 512K Macintosh

Designed by PaineWebber Vice President Lee Isgur. A portfolio management program that differentiates among stocks, bonds, and options, and records each purchase as an individual lot with price, commission, and date. Can save each stock's yearly data, and adjust records for splits and dividends.

Managing the Market \$150

MECA; (203) 222-1000

192K IBM PC/PCjr; modem required

Can be used by itself to gather stock prices from Dow Jones News/Retrieval service, to update your *Managing Your Money* portfolio, or to download prices to 1-2-3 or other compatible programs. Allows you to build and maintain lists of "hot" prices and retrieve information for each of your stocks.

Personal Investing \$99

BPI Systems; (512) 328-5434

IBM PC and compatibles
For the private investor to collect and analyze price and volume data for stocks, options, and futures. Program gathers price/volume information by phone and stores it on disk and allows you to chart for technical analysis.

TAS-64 \$60

Abacus Software; (616) 241-5510

Commodore 64/128; modem optional

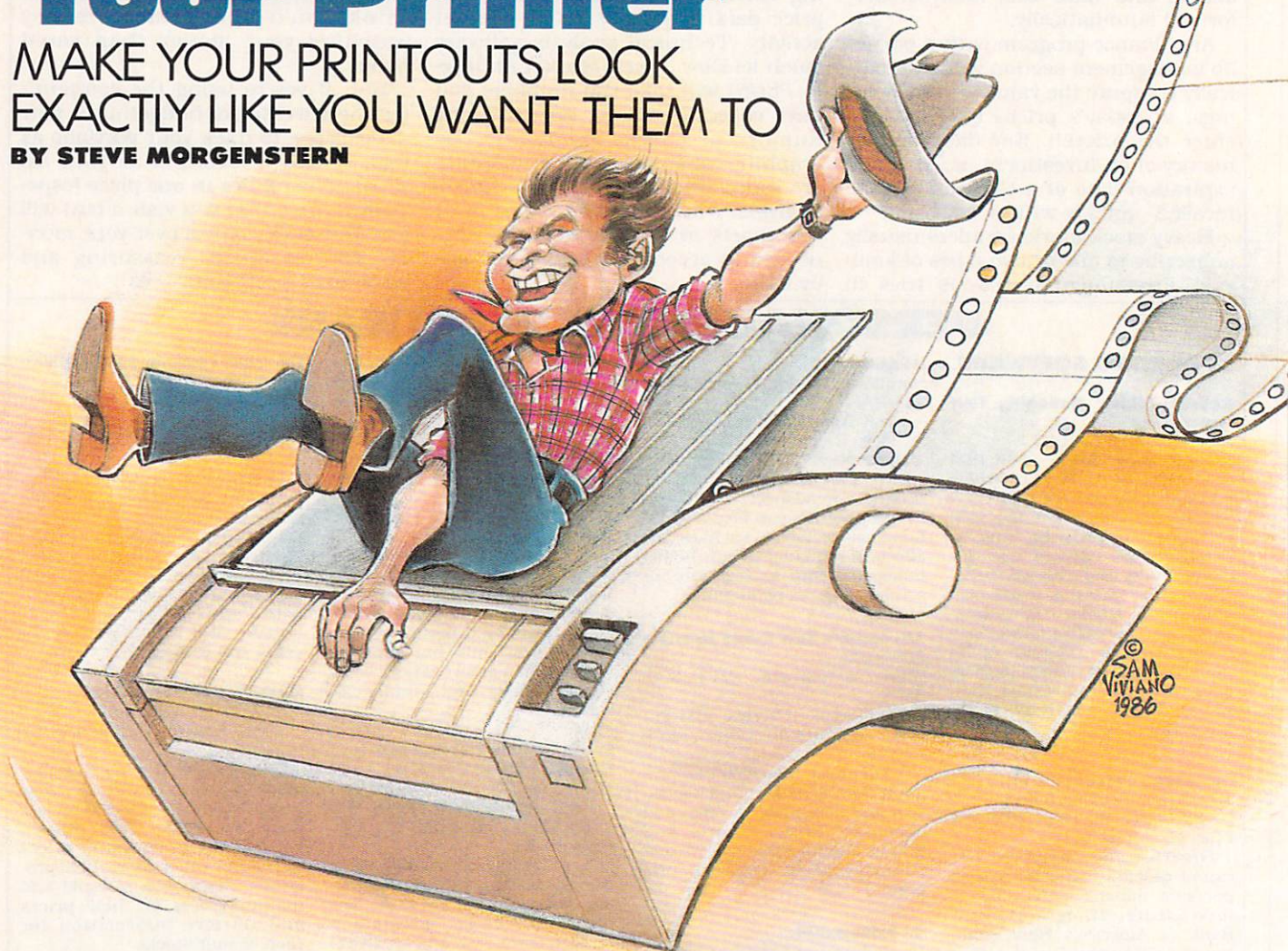
A charting and technical analysis system. Data can be automatically retrieved on-line through Dow Jones or entered manually. Split screen allows several charts and graphs plotting technical indicators to be displayed simultaneously.

GUIDE TO WRITING WITH COMPUTERS: PART 6

Learn to Control Your Printer

MAKE YOUR PRINTOUTS LOOK EXACTLY LIKE YOU WANT THEM TO

BY STEVE MORGENSTERN



In the old days, writing was pretty straightforward. Whether you worked with a quill pen or a typewriter, you decided what you wanted to write and put it down on paper. If you wanted something underlined, you underlined it. If your words had to be arranged in columns, you simply lined them up. If you needed a number raised above the line to indicate a footnote, no problem—you just put it there.

Word processing, on the other hand, adds both power and complexity to the task of making your writing look right on paper. Now, instead of simply putting the words where you want them by hand, you have to tell a printer

where to put them, how much space to leave, when to start and stop underlining, and so on. But one of the biggest problems people have with word-processing software is getting onto paper what appears on the screen.

So is writing with a computer worth the effort? Of course. If my editor had to wait until I handwrote or typed a reasonably clean draft, this article wouldn't appear until January of 1988. Yet, writing with a word processor does require an understanding of the way your computer tells the printer what to do and how you can control it.

STEP ONE: KNOW THY PRINTER!

Most word-processing programs are designed to work with a variety of printers and therefore list a wide range of special features, such as underlining, boldfacing, and

Contributing editor STEVE MORGENSTERN wrote about word-processing add-ons in Part 2 of the "Guide to Writing with Computers" series.

ILLUSTRATION BY SAM VIVIANO

a choice of typefaces such as condensed print. However, just as a singer cannot necessarily hit a high C simply because it's written in the sheet music, your printer won't perform tricks it wasn't built to accomplish, even if your software is able to give the commands. For example, just because your word processor has the capability to do superscripts (those above-the-line characters, such as numbers in a footnote or a trademark™) or subscripts (the below-the-line characters found, for instance, in chemical formulas; e.g., H₂O) does not necessarily mean you can use them. Your printer must have that capability as well. The first place to look, then, is not your word-processing software manual, but your printer manual, which will explain precisely what features are available.

ESTABLISHING COMMUNICATIONS

The first step in using your printer's features is "configuring" your word processor (also known as "installing a printer"). A basic understanding of what's happening when you print a document will go a long way in making the process of configuring your printer more understandable.

When you write on your computer, you are putting a bunch of letters in a pleasing order. When you print the document, the computer sends numeric codes representing these letters to the printer in the same order. These codes are called ASCII, which is the acronym for American Standard Code for Information Interchange.

However, not every numeric code your computer can send prints an actual character. There are lots of non-printing codes as well, and these are used to control printer functions such as underlining and boldfacing, line spacing, superscript and subscript positioning, and so forth.

Things would be a lot simpler if every printer manufacturer had used the same codes to trigger the same printer action, but they didn't. If you send the ASCII codes 27 and 71 to an Epson printer, it will begin printing in bold type. For a C. Itoh printer, though, you have to send 27 and 33, while an Okidata responds to 29 and 31. (By the way, 27 here is the code for the ESCAPE key. For more information on these codes, see "Secrets of Computing Compatibility" in the June 1986 issue of FAMILY COMPUTING.)

SET IT AND FORGET IT

Sending the codes is not usually your responsibility. You tell the word processor you want to underline, and it sends the codes to the printer. However, the word processor has to know which codes to send for the printer you are using. That is the information you enter when you configure or install your printer. The information the word processor needs comes straight from your printer manual.

Happily, once you've done it once, the configuration information is saved on the program disk, so you don't have to perform the procedure every time you write.

For simple word processors, configuring the printer is only a matter of a few questions, and even these may be skipped if the preset configuration works with your printer. (Give it a try—rest assured that there is no way you can hurt your printer, your computer, or your program by using the wrong codes.)

Even word processors that support many printer features may be easy to set up if the manufacturer has included a prepared set of printer codes in a file called a printer driver. *AppleWorks* (Apple Computer), for example, comes with 12 prepared printer choices. The IBM version of *WordPerfect* (WordPerfect Corporation) offers

over 90 printer drivers. If your printer is included in the list of printers supplied with your word-processing software, then installing it will be a simple matter of making a selection. If not, there will be a step-by-step procedure for entering the codes that control your printer into a special printer driver file. This is called a "custom installation."

Even then, your word processor may not give you access to all the printer's features. For example, I configured *AppleWorks* to work with an Okidata 92 printer. Like many dot-matrix printers, the Okidata has two printing modes—a fast mode used for printing drafts and a mode that strikes each letter twice to create a higher-quality image (often called Near Letter Quality, or NLQ). Unfortunately, there is no word-processing command in *AppleWorks* that will let me switch between draft and NLQ printing. My solution? I created two separate printer drivers for the same printer. One has the codes for draft mode, the other has the codes for NLQ mode, and I switch between them when I want to change print quality. It isn't an elegant solution: *AppleWorks* allows only a single custom printer, so I need two separate program disks for my "dual printer" arrangement. Also, once I've set the printer to NLQ, the easiest way to reset it to draft mode is to turn it off and then on again. Nevertheless, this method works, and the idea of creating more than one printer driver for the same printer can often help get around word-processing software limitations.

SENDING CODES WITH YOUR DOCUMENT

Some other word processors allow you to send control codes to the printer directly within your document, embedded in your text wherever needed. For example, the *First XLEnt Word Processor* (XLEnt Software) for Atari computers lets you include non-printing characters right in the word-processing file itself (see review in this issue). *First XLEnt's* special formatting command called SEND BYTE (SB) is its key. (Other word processors use different techniques to send control codes to the printer, but the results are the same.)

To begin, look up the ASCII control codes you need in your printer's manual. Depending on your printer, these codes would be characters generated by pressing keys such as ESCAPE and C to start underlining, ESCAPE and D to stop it. Then, enter the appropriate character codes in your text as a format command preceded by the letters SB. When your *First XLEnt* document is sent to the printer, the codes you included go with it, and the printer will respond as instructed. Of course, when you use this technique, you have to remember to turn off, as well as turn on, special printing features. If you start to underline, for example, and forget to include the stop command, everything will be underlined through the end of the document.

Also keep in mind that the word processor doesn't know what effect those printer control characters have on your printout, so the on-screen print preview feature may be rendered inaccurate.

FROM PLAIN PAGES TO PRINTS CHARMING

Gaining control of your printer's special features can make your writing more expressive, with type styles such as boldfacing and underlining to highlight key points, making your documents fit the occasion. You can solve practical problems, too, like fitting a wide chart onto narrow paper by switching to condensed type. Just learn the control codes and the way to send them with your word-processing software, and you'll soon be printing prose like the pros. ☐

If you were going to spend the next six months on a desert island with your computer and four or five pieces of software, which programs would you choose? That's essentially the situation many new computer owners find themselves in. Computers are expensive. Add the cost of a printer, extra memory, disks and disk drives, and whatever else a particular manufacturer doesn't include in the purchase price, and often there's not much left for software. That's why you want to make every program count.

THE FIRST STEPS IN PICKING YOUR PROGRAMS

To help you get your software library off to a grand start, we've asked FAMILY COMPUTING reviewers and other computer owners around the country to recommend programs that they've discovered to be valuable. Some are brand-new, while others are tried-and-true favorites. In the pages ahead, we've compiled sections for several popular computer models filled with notes and quotes about some of the best programs out there. Each machine's software pluses and minuses will be weighed, too. Good programs were often recommended for several computers; this group will be listed separately. While we don't mention all the quality titles in each category for every computer, we feel certain that the products we've picked can all be terrific additions to anyone's basic software library.

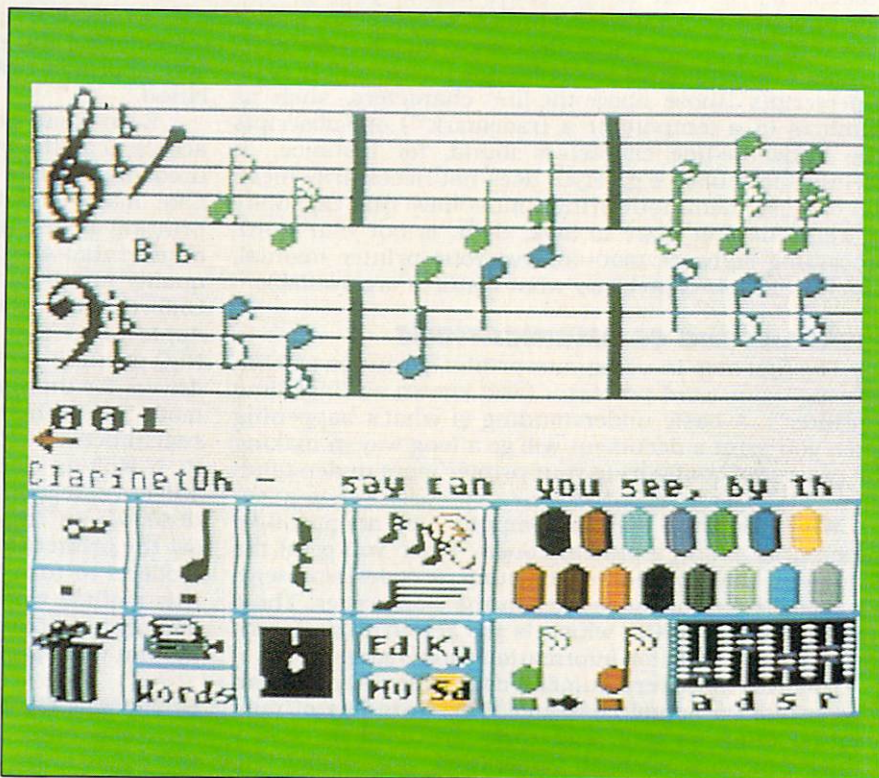
SOFTWARE CHOICES, CATEGORY BY CATEGORY

To decide what you need in your own collection, start thinking about how you'll use each type of software.

Word Processors. Practically everyone agreed that word-processing software will probably be the most frequently used item on your shelf. "I use my word processor almost every day," said Fred Goodson, a chemical engineer with an Apple computer at home and an IBM PC at work. Every computer offers a wealth of word-processing choices, from professional feature-laden packages to simpler models suitable for typing an occasional letter or homework paper, with a wide range of programs in between that can be adequate for both adults and children.

Data Bases. In addition to business

TAN A. SUMMERS is a regular software reviewer for FAMILY COMPUTING.



You don't need musical notes to write music with *The Music Studio*.

applications, a data base is a boon if you like to organize recipes, video tapes, valuables, and the like, or if you maintain records for a club or team. Managing data isn't just for mom and dad, either. My daughter Laurel, a high-school junior, uses *PFS: File* (Software Publishing Corp.) to keep track of her collection of "Doctor Who" tapes. Simple programs, such as *PFS: File* or *Bank Street Filer* (Broderbund), are sufficient for most non-business uses, since few people have any need to type vast quantities of data.

Number-Crunching Software. You can use a spreadsheet to figure your taxes, keep track of your budget, work algebra problems, calculate mortgage payments, and much more. However, you'll have to learn how to use it first, and then spend time setting up and testing individual applications. Unless you really enjoy working with numbers and formulas, you might be happier with ready-made application programs that do the same jobs with less work. Some examples are *Tax Preparer* (HowardSoft) for calculating taxes, and *Dollars & Sense* (Monogram) for financial management. If you're unsure whether you'll use a spreadsheet, a good solution might be an integrated package that combines one with other programs such

as a word processor or data base.

Education. If you have children at home, educational software is probably high on your list. Get the most for your money with programs that provide several activities on one disk or various difficulty levels, recommends Judith Zornberg, a computer consultant who selects software for the New York City Board of Education and a FAMILY COMPUTING reviewer. Some examples are *Math Blaster* (Davidson & Associates), the classic *Kindercomp* (Spinnaker), and the magazine-like disks called *Microzine* (Scholastic Software). Especially valuable are simulations that let kids try things on-screen that they couldn't do in real life, such as *Millionaire* (Blue Chip Software), which simulates the stock exchange and lets you invest thousands of dollars. Don't worry if the programs look like games. Keeping the child's interest is part of good educational software, so action, music, and bright screens are the norm.

Communications. While you and your computer can lead a full life together even if you never go on-line, being able to communicate by telephone with other computers—and with other people via computers—greatly broadens your scope. (Remember that you will need a modem and a serial port as well as communications

for Starting Off

BY TAN A. SUMMERS

software to get started.) Telecomputing offers a means of collecting information from many sources. The electronic bulletin boards and information services you reach in this way frequently offer free software and an immediate source of help for computing problems as they arise. "I learned by leaps and bounds once I got into on-line special interest groups," said Tom Herman, who uses IBM-compatible computers to run a lighting business in New York.

Utility Programs. This broad category includes many products that make computing easier. Desktop utilities such as *SideKick* (Borland International) and *BatteryPak* (Batteries Included) let you keep notes, make appointments, or use an on-screen calculator while another program is running. Others, like *The Norton Utilities* (Peter Norton Computing), restore files you've erased by accident or perform tasks that your computer's operating system neglects.

Entertainment. Everyone needs to relax. Besides, recreational programs provide a great way to show off your computer. How you do it will depend on your interests. If you like games, you'll have no trouble finding something to suit your taste. The computer also offers self-expression through new means with software for music and art.

As with any kind of software, recreational programs stay interesting longer if they offer a wide range of functions. Les Blatt, an Apple owner who uses mainframe computers on the job as a writer for "ABC World News Tonight," likes to relax with games that let you design your own playing board or adventure scenario,

especially *Pinball Construction Set* (Electronic Arts). "For kids who grew up playing pinball, this is a chance to build your own dream machine," said Blatt. His 6- and 8-year-old daughters, Cheryl and Elana, like it, too.

SOFTWARE FOR MANY MACHINES

PaperClip. Comes with *SpellPack* spelling checker. "It lets you preview your document before printing, and supports almost any printer you can imagine," said Woody Lovill, a computer owner since 1981 and assistant manager for Software Centre International, Metairie, Louisiana. *Batteries Included.* Apple IIe/IIc, Atari, C 64/128. \$45-\$80.

The Print Shop. One of the best-loved programs around. You can print out banners, invitations, signs, and stationery. "I create attention-getting report covers with it," said Polly Goodson, an eighth-grade honor student in my hometown of Metairie, Louisiana.

"I make calendars and other teaching aids using *The Print Shop* along with its utility program, *The Print Shop Companion*," said Leslie Blatt, an elementary school librarian. *Broderbund Software.* 64K Apple, Atari, C 64/128, IBM PC/PCjr, Macintosh. \$45-\$80. *The Print Shop Companion* (not available for Macintosh). \$35-\$40.

The Information Connection. All the features most users need in a communications program. Lets beginners practice before ever going online. "You don't even need a modem for the tutorial. Then, when you get one, you can dial up a real information service," said Cathy Frank, an

educational computer consultant from Vermont and a reviewer for *FAMILY COMPUTING*. *Grolier Electronic Publishing.* Apple IIe/IIc, C 64/128, IBM PC/PCjr. \$60.

KidWriter. Children manipulate ready-made pictures into a scene, then write text to create a story. "Six-year-old Timmy made so many pictures that my wife, Lisa, put them together into a book and sent them to Grandma as a gift," said Fred Goodson. *Spinnaker.* Apple, Atari, C 64/128, IBM PC/PCjr, Tandy Color Computer. \$27-\$40.

The Music Studio. A bright, new program that makes music easy enough for piano-lesson dropouts. "It has a way of writing music that doesn't need notes. You sort of draw the music, get it so you like the way it sounds, and then the program turns it into a standard musical score," said Steve Morgenstern, a contributing editor of *FAMILY COMPUTING*, who has years of computer experience. *Activision.* Amiga, Atari, Atari ST, C 64/128, IBM PCjr, Tandy 1000. \$35-\$60.

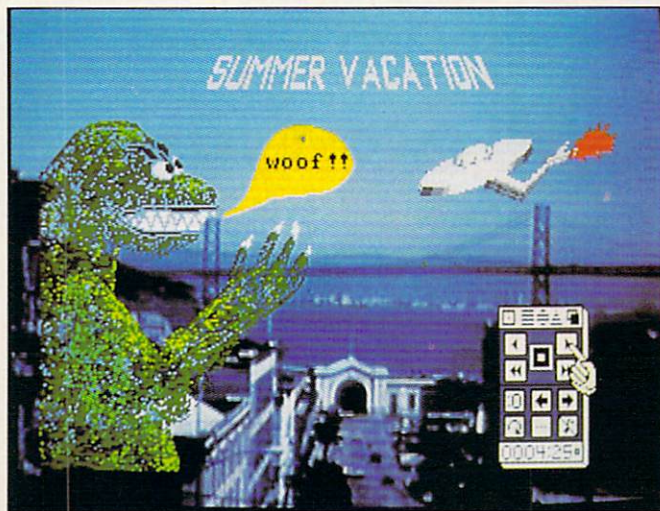
Chem Lab. Lets you mix chemicals on-screen to see what will happen. As Tony Morris said in his original review, "Young scientists can indulge in their creative fantasies without parental fear." *Simon & Schuster.* 64K Apple, C 64/128, IBM PC/PCjr. \$40.

Word Attack! Kids with a wide range of skills can practice basic vocabulary at various difficulty levels. Put your own words in, too, with the editor. *Davidson & Associates.* Apple, C 64/128, IBM PC/PCjr, Macintosh. \$50.

Infocom text adventures. Not for the hasty, these text-only games come in versions for all skill levels (marked



Below the Root merges sharp graphics with a no-typing adventure.



Combine excellent animation with sound effects using Deluxe Video.

right on the package) and almost every microcomputer. They cleverly test your imagination while entertaining you with witty repartee. Many recommendations for at least one, ranging from the beginning-level *Seastalker* to the expert-level *Deadline*. *Infocom/Activision*. Amiga, Apple, Atari, Atari ST, C64/128, IBM PC/PCjr, Macintosh, Tandy Color Computer, Tandy Models III/4. \$40-\$50.

Alice in Wonderland, Below the Root, and Treasure Island. Three from the Windham Classics series that combine colorful graphics with simple, no-typing adventures. Based on children's books, these interactive programs inspire youngsters to read the book, too. "I like the music and the trees. I probably never would have heard of the books if I hadn't seen the game first," said Kasey Chappelle, a sixth grader in Metairie, Louisiana, about *Below the Root*. *Spinnaker Software*. 64K Apple, IBM PC/PCjr (Alice in Wonderland available only on Apple). \$40.

AMIGA

+Pluses: Outstanding color graphics and stereo sound capabilities mean unique programs like *DeluxeVideo*.

-Minuses: Still not enough software around, especially productivity packages such as a professional-level word processor.

DeluxeVideo. "It's an animation program that lets you add digitized sound and record your finished products on a video recorder or play them back on-screen," said David Avgikos, manager of a software store, Amiga lover, and talented amateur artist. *Electronic Arts*. \$100.

Deluxe Music Construction Set and Instant Music. "You can write music with *Music Construction Set*, or use ready-made tunes from *Instant Music*," said Avgikos. *Electronic Arts*. DMCS

also for Macintosh. \$100 (DMCS); \$50 (Instant).

Marble Madness. "Amazing graphics, totally arcade quality. It's fast-paced, and has great sound effects. I especially like the fact that two people can play," said Avgikos. *Electronic Arts*. Also for C 64/128. \$35-\$50.

The Halley Project. Spiffed up especially for the Amiga, a breathtaking simulation that plunges you into the astronomy of the solar system. *Mindscape*. Also for Apple, Atari, C 64/128. \$30-\$45.

APPLE II SERIES

+Pluses: Especially deep in educational and entertainment software. A lot of fine tools for business productivity, too.

-Minuses: Apple software doesn't offer the most stunning graphics nor the best sound (other than the new IIGs, for which there's not much new software yet anyway). Not as powerful for business as the IBM or Mac.

AppleWorks. Perhaps the best single software choice for the Apple, according to many. As Steve Morgenstern pointed out in the June 1986 issue of *FAMILY COMPUTING*, add-ons such as spelling checkers, desk accessories, outliners, and spreadsheet templates are readily available, making *AppleWorks* more useful than ever. "It's the definitive word processor, spreadsheet, and data-base package. The average home user will probably not need more," said Les Blatt. *Apple Computer, Inc.* \$250.

Dazzle Draw. "We like *Dazzle Draw* because the double high-res colors are wonderful and it's exceptionally easy to use," said Fred Goodson, who, along with his wife, Lisa, bought an Apple as an educational tool for their five children. *Broderbund Software*. \$60.

Magic Slate. A word processor that

grows with students because it has three difficulty levels. "Children do best if they have a word processor intended just for them . . . it's easier than *Bank Street Writer*," said Cathy Frank. *Sunburst Communications*. \$100.

Fantavision. "Graphics software where you draw the beginning and ending images, and the program animates them. The finished cartoons don't require the main program to run, so you can make animated greetings for friends who have Apples," said Cathy Frank. *Broderbund Software*. \$50.

Crossword Magic. Put words of your choice into custom, computer-generated puzzles. "I recommend it for older students. They can use it to turn questions and answers from the day's homework into the fun of a crossword puzzle," said Judith Zornberg. *Mindscape*. Also for Atari, C 64/128, IBM PC/PCjr. \$50.

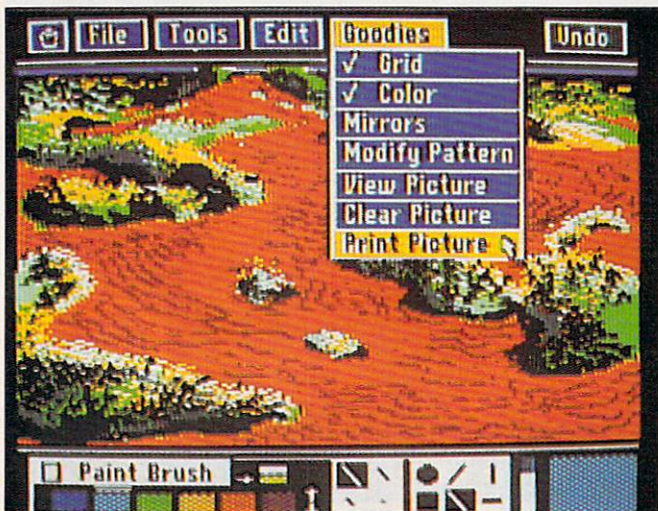
Remember! Helps students of all ages develop strategies for memorizing facts, using sound, sight, and word mnemonics. *DesignWare*. Also for C 64/128, IBM PC/PCjr. \$80.

Wizardry and The Bard's Tale. Two challenging sword-and-sorcery games that merge text with graphics. Strange beasts to vanquish and challenging puzzles to solve. "They're quite intriguing, and the monsters are amusing," said Les Blatt. *Sir-Tech* (*Wizardry*). Some versions also for IBM and Macintosh. \$35-\$60. *Electronic Arts* (*Bard's Tale*). Also for Amiga, C 64/128. \$40-\$50.

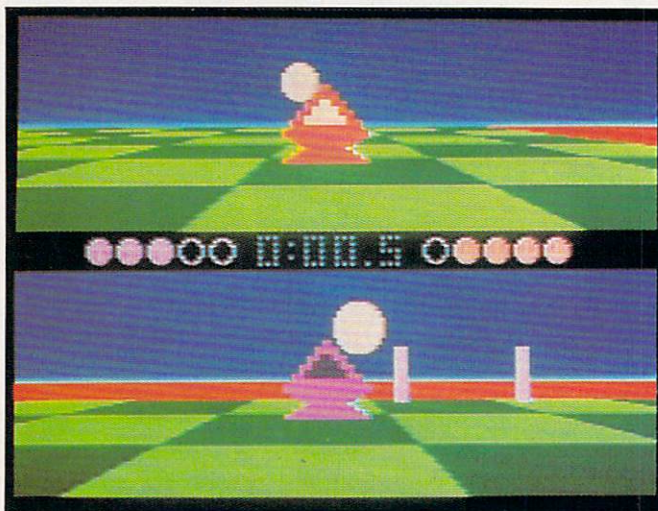
ATARI 800/XL/XE SERIES

+Pluses: The best eight-bit graphics and pretty good sound, meaning great games and a fine sampling of educational packages.

-Minuses: Not as many new programs coming out for it as for some other



Dazzle Draw is mouse-driven and exceptionally easy to use.



Fantastic graphics and screamingly fast action in *Ballblazer*.

older machines (Apple, C 64, IBM). And since 80 columns on-screen is still the exception rather than the rule, it's not the easiest for work.

SynFile Plus. "SynFile Plus is a fairly powerful data-management program, yet it's easy to use and not too expensive," commented Woody Lovill, who bought his first Atari six years ago. "Although it's a data base, you can use it for mathematical calculations as well, almost like a spreadsheet." Broderbund/Synapse. \$50.

AtariWriter Plus. A standard for Atari word processors; with spelling checker. Supporters said it's "still the best thing for the eight-bit Atari." Atari Corp. \$50.

Star Raiders. No Atari library would be complete without at least one classic game. "Star Raiders was one of the first for the Atari, but it's still one of the best shoot-'em-ups around," said Woody Lovill. Atari Corp. \$7.

Ballblazer. "If you have a joystick, you have to get this one," said Steve Morgenstern, who once edited an Atari magazine. The action's so fast it makes your head spin; speed across the playing field battling for possession of a ball. Epyx. Also for Apple, C 64/128. \$30-\$40.

ATARI ST

+Pluses: Impressive graphics for games, excellent speed for work. Software that uses GEM interface means fewer commands to remember.

-Minuses: Still rather young, so its software base is not as deep as on an Apple, IBM, C 64, or its older Atari siblings.

Actually, the ST's largest strength for beginners is that it comes with two decent programs—a word processor (*First Word*) and painting software (*Neochrome*)—as well as a VT52 terminal emulator for communications and the efficient GEM desktop.

Thunder! A spelling checker that works as you type, quickly and without distracting you. *Batteries Included.* Also for 512K Macintosh. \$40-\$50.

Homework Helper: Math and Homework Helper: Writing. Two programs that walk kids through the steps necessary to solve math word problems or write a good report. *Writing Helper* can double as a simple word processor. Spinnaker Software. Also for Apple, C 64/128, IBM PC/PCjr. \$33-\$50 each.

Sundog. A real-time action game in an exciting, futuristic adventure format. "If you could have just one game for your ST," said Woody Lovill, "it ought to be *Sundog*. The graphics and story line are great." FTL Games/Accolade, Inc. Also for Apple. \$40.

C 64/128

+Pluses: A complete range of software choices, many relatively inexpensive. Colorful graphics and fine sound mean a slew of educational programs and classic games.

-Minuses: Not a true productivity machine, although there are plenty of programs in those categories.

Word Writer, SwiftCalc, and Data Manager 2. While sold separately, this word processor, spreadsheet, and data base integrate information easily. Exceptionally full-featured for the price. Different versions of each title for the C 64 and the C 128. Time-works, Inc. Also for the Atari ST and IBM PC. \$40-\$80 each.

Fast Load. You can speed up the disk drive (which may be the slowest computer peripheral in existence) through the use of *Fast Load*, a cartridge that stays plugged in while you run disk-based programs. Simplifies file management by letting you select functions from a menu. Epyx. \$40.

Music Shop. Music production with

complete control of the Commodore's three voices. Includes many sample tunes, too. Print out finished musical scores as well as play them. "It's a lot easier to play than the violin," commented my 11-year-old daughter, Cherry. Broderbund Software. \$45.

Agent U.S.A. One of Cherry's favorites, this geography game almost guarantees that kids will learn their states and capitals because they'll have fun while playing. Scholastic Software. Also for Apple, Atari, IBM. \$30-\$40.

Lode Runner. A maze-like strategy/arcade game that's a special favorite of Howard, my 9-year-old, and my editor, David, who's 35. They can develop their own play screens, too, a mission almost as challenging as beating the ready-made levels. Broderbund Software. Also for Apple, Atari, IBM PC/PCjr, Macintosh. \$35-\$40.

IBM PC AND COMPATIBLES

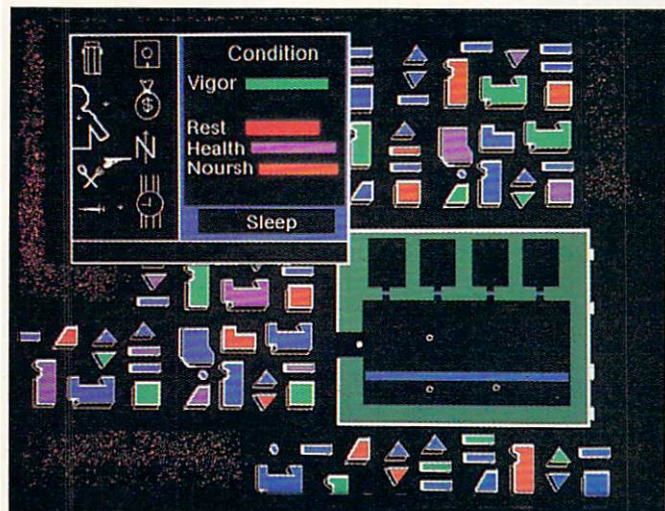
+Pluses: A cornucopia of business software, with greater productivity power than most other computers.

-Minuses: Fewer educational and entertainment programs than the Apple, C 64, or Atari, but with the advent of popular MS-DOS clones, IBM is starting to catch up.

Leading Edge Word Processor. Although it comes with the Model D, it's not just for the Leading Edge computer. David Avgikos called it a great value. "It's inexpensive, very easy to use, and full-featured. It has menus for everything. You press one key, and it gives you a menu with your choices." Leading Edge Software. \$100.

Reflex. "I use *Reflex* for the little jobs. I found it so intuitive, with good on-line help," said Ward Christensen, developer of the important XModem file transfer protocol.

Others agree. "I had a hard time



For science-fiction adventure excitement, try *Sundog*.



Jet puts you in the pilot's seat of a high-performance airplane.

understanding how to set up a data base, so I never got one. Then I purchased *Reflex*. It became so easy to create forms that all of a sudden I was able to grasp the whole idea," said Tom Herman. *Borland International*. \$150.

SideKick. Herman likes this desktop utility, too. "Having the pop-up notepad always available is one of the easiest ways to get information into the computer. Before I had a word processor, I did invoices with it, using the calculator mode to add up the totals. The phone dialer became my normal mode of calling everyone." *Borland International*. Also for Macintosh. \$85-\$100.

Dr. Halo II. A paint program that can be configured to use almost any combination of graphics adapter, printer, and input device—joystick, mouse, etc. Many editing features and easy-to-use, pop-up menus. *IMSI*. \$140.

Flight Simulator II and **Jet**. Mentioned by many IBM users. Get behind the throttle of a light plane or high-performance jet to taste the thrill of flying without the danger or expense. *SubLOGIC*. Both programs also for Apple, C 64/128, Atari, Atari ST, Amiga, IBM PC, Macintosh. FS only: (Macintosh and IBM versions marketed by Microsoft). \$40-\$50 each.

MACINTOSH

+Pluses: Productivity packages are easier to work with because of common user interface (mouse, pull-down menus, windows, etc.). The champ at desktop publishing, and a graphics delight if you're not bothered by the lack of color.

-Minuses: Comparatively few educational packages. Games are high-quality, but limited in number.

Microsoft Works. The most talked about new Mac program as we went to press. One of everything: word processor, communications, spreadsheet, and data base. "It does a more effective job of integrating all of the important software functions into one product than any other package I've seen on any other microcomputer," said Dan Shafer, a writer of six computer books and numerous magazine articles, who has been using *Works* for several months. *Microsoft Corp.* \$295.

BatteryPak. "Provides the Mac with a calendar, phone dialer, memo pad, and calculators, and then goes a step further with several more utilities," said Sharon Aker, a computer journalist whose specialty is the Macintosh; her work appears regularly in *FAMILY COMPUTING*. *Batteries Included*. \$50.

SuperPaint. "My vote for best Macintosh graphics program. With all the features of *MacPaint*, but lets you move objects the way you can with *MacDraw*," said Aker. *Silicon Beach Software*. \$99.

MacBillboard. "We use it to make everything from larger-than-life posters of Einstein and Beethoven to custom T-shirts," said Richard and Kate Mancini, the parents of the first *FAMILY COMPUTING* Computing Family of the Year. *CE Software*. \$35.

Uninvited. "Like a text adventure, but you don't have to type. You point at a verb and click, and then point to something on the screen. The scene then animates. When we broke a mirror, the pieces fell with a realistic, digitized sound of glass breaking," said Steve Morgenstern. *Mindscape*. Also for Amiga. \$50.

KidsTime. Provides several different activities. "My sons, Nicholas and Nathaniel, used to be happy with the software Mom wrote for them until they saw *KidsTime*," said Aker. (See review in this issue.) *Great Wave Software*. \$50.

TANDY COLOR COMPUTER

+Pluses: Reasonably priced programs in a number of categories.

-Minuses: Screen display limits productivity uses. Tandy's past history with outside software developers

PUBLISHERS' PHONE NUMBERS

Accolade, Inc.	(617) 449-4655.
(408) 446-5757.	Michtron
Activision	(313) 334-5700.
(415) 960-0410.	Microsoft Corp.
Apple Computer, Inc.	(206) 882-8080.
(408) 996-1010.	Mindscape
Atari Corp.	(312) 480-7667.
(408) 745-2000.	Monogram
Batteries Included	(213) 215-0355.
(416) 881-9941.	Peter Norton
Blue Chip Software	Computing
(415) 546-1866.	(213) 453-2361.
Borland International	Scholastic Software
(408) 438-8400.	(212) 505-3501.
Broderbund Software	Sierra On-Line
(415) 479-1185.	(209) 683-6858.
CE Software	Silicon Beach Software
(515) 224-1995.	(619) 695-6956.
Colorware	Simon & Schuster
(718) 296-5916/	(212) 333-2882.
(800) 221-0916.	Sir-Tech
Davidson & Assoc.	(315) 393-6633.
(213) 534-4070.	Software Pub. Corp.
DesignWare	(415) 962-8910.
(415) 546-1866.	Speech Systems
Electronic Arts	(312) 879-6880.
(415) 571-7171.	Spinnaker Software
Epyx	(617) 494-1200.
(415) 366-0606	SubLOGIC
Great Wave Software	(217) 359-8482.
(415) 325-2202.	Sunburst Comm.
Grolier Electronic Pub.	(914) 769-5030.
(800) 858-8858.	Tandy Corp.
HowardSoft	(817) 390-3300.
(619) 454-0121.	The Learning Company
IMSI	(415) 328-5410.
(415) 454-7101.	Timeworks
Infocom/Activision	(312) 948-9200.
(617) 492-1031.	VIP Technologies
Leading Edge Software	(805) 968-4364.

(lack of support) limits availability.

VIP Writer. "Probably the most powerful CoCo word processor available. You can preview what a document will look like before you print, and it has full formatting ability," said Charles Angelich, who, like many computer users, has taken a learn-as-you-go approach. *VIP Technologies*. \$70.

Some other CoCo programs Charles recommends:

VIP Integrated Library. VIP Writer Plus. "The library gives you an opportunity to get some exposure to all the software types people talk about, such as a spelling checker and spreadsheet. The terminal program is popular, although not the most powerful." *VIP Technologies*. \$150.

CoCo Max II. "The Cadillac of CoCo paint programs. Its additional hardware modification gives you more confident control when you draw with the joystick or mouse." *Colorware Inc.* \$80.

Lyra. "Lets you write sheet music and play it back. It gives you access to several voices. You can move notes around like a word processor moves words." *Speech Systems*. \$55.

Time Bandit. "I was impressed with the color and graphics of this real-time game. The screens are quite elaborate, and it has an interesting story, too. I especially like the fact that the game is fast." *Michtron*. Also for Atari ST. \$26.

Software from The Learning Company and Spinnaker. Two picks from two companies with several classic educational games for the CoCo. *Juggle's Rainbow* (TLC) teaches children the concepts of up and down and right and left that are necessary pre-reading skills. *Kids On Keys* (Spinnaker) familiarizes children with the computer keyboard and lets them practice beginning reading. Also for Apple, Atari (published by Atari Corp.), C 64/128, IBM PC/PCjr (published by IBM). \$20-\$30 (*Juggle's*); \$21-\$30 (*Keys*).

THE NEXT STEP

You may be asking yourself whether you really need any of these products in the first place. Is it really worth the expense? And will you really continue to use everything? "Yes!" was the repeated response from computer users everywhere.

Richard Mancini summed up feelings about computing shared by many people we talked with to prepare this article: "We love our computer. The more we use it, the more we find things we want to do. We are committed to the technology." ☐

ANNOUNCING THE THIRD ANNUAL

Win One of 50 Prizes—More Than \$5,000 Worth of Computer Systems, Hardware, Software, and Other Prizes to Be Given Away



Has your family found some winning uses for its computer? Yours could be one of the families to win a newly released Apple IIgs computer system, complete with printer and monitor. Or you could win an Okidata letter-quality printer, a Tandy 102 laptop computer, a Hayes 1200-baud modem, software, or one of dozens of other prizes in FAMILY COMPUTING's "Third Annual Computing Family of the Year Contest."

FAMILY COMPUTING is looking for families who are using their computers together in especially rewarding, unique, and/or efficient ways. If you don't think your own family is ready to be our "1987 Computing Family of the Year," nominate friends, relatives, or neighbors who are. Remember, of course, that, although there's only one Grand Prize, there will be lots of other prizes given away.

WHAT YOU NEED TO DO

Here are some of the questions we'd like you to answer. Put your story into essay form, with a maximum of 2,000 words.

- Why did your family buy a computer?
- Has your computer surpassed its original expectations? If so, how?
- How has it changed the lives of family members and how the family does things?
- How does each family member use the machine?
- How does the family use the computer together?
- Also, be sure to include the following information: 1) your name, address, and phone number; 2) computer and other hardware you own; 3) software packages you use most; 4) the month and year your family bought its computer(s); 5) the names and ages of all family members.

Entries will be judged by the FAMILY COMPUTING staff. It's not your technical expertise that's important to us. What is important is how you put your computer to use. The family whose essay

the judges deem best—that is, the family who has made the greatest leaps and bounds with a computer—will become our "1987 Computing Family of the Year." Good luck!

GRAND PRIZE

Apple IIgs Computer System. Includes system (CPU), keyboard, mouse, 3.5-inch disk drive, RGB (color) monitor, and ImageWriter II printer. Suggested Retail: \$2,500

FIRST PRIZE

Okidata Microline 293 Letter-Quality Printer. Suggested Retail: \$949

SECOND PRIZE

Hayes Smartmodem 1200 and Smartcom II Software. Suggested Retail: \$748

THIRD PRIZE

Tandy 102 Laptop Computer. Includes computer, printer cable, and modem cable. Suggested Retail: \$534

FOURTH PRIZE

Home-Control System from X-10 (USA) Inc. Includes three modules, software, and cables. Suggested Retail: \$115

FIFTH PRIZE: FOUR WINNERS

\$100 Worth of Software and Accessories.

SIXTH PRIZE: SIX WINNERS

Subscription to CompuServe Information Service. Suggested Retail: \$39.95

SEVENTH PRIZE: 15 WINNERS

New or Extended One-Year Subscription to FAMILY COMPUTING. Suggested Retail: \$19.97

EIGHTH PRIZE: 20 WINNERS

FAMILY COMPUTING Tote Bag.



The Ofstehage family of South Dakota, our 1986 Computing Family of the Year.

CONTEST RULES

1. Deadline: Your entry must be postmarked by March 31, 1987.
2. Include a family photo and identify each member on the back.
3. Keep your entry shorter than eight double-spaced pages.
4. Scholastic Inc., employees, advisory board members, and members of their immediate families are not eligible.
5. Previous winners of the "Computing Family of the Year Contest" are not eligible.
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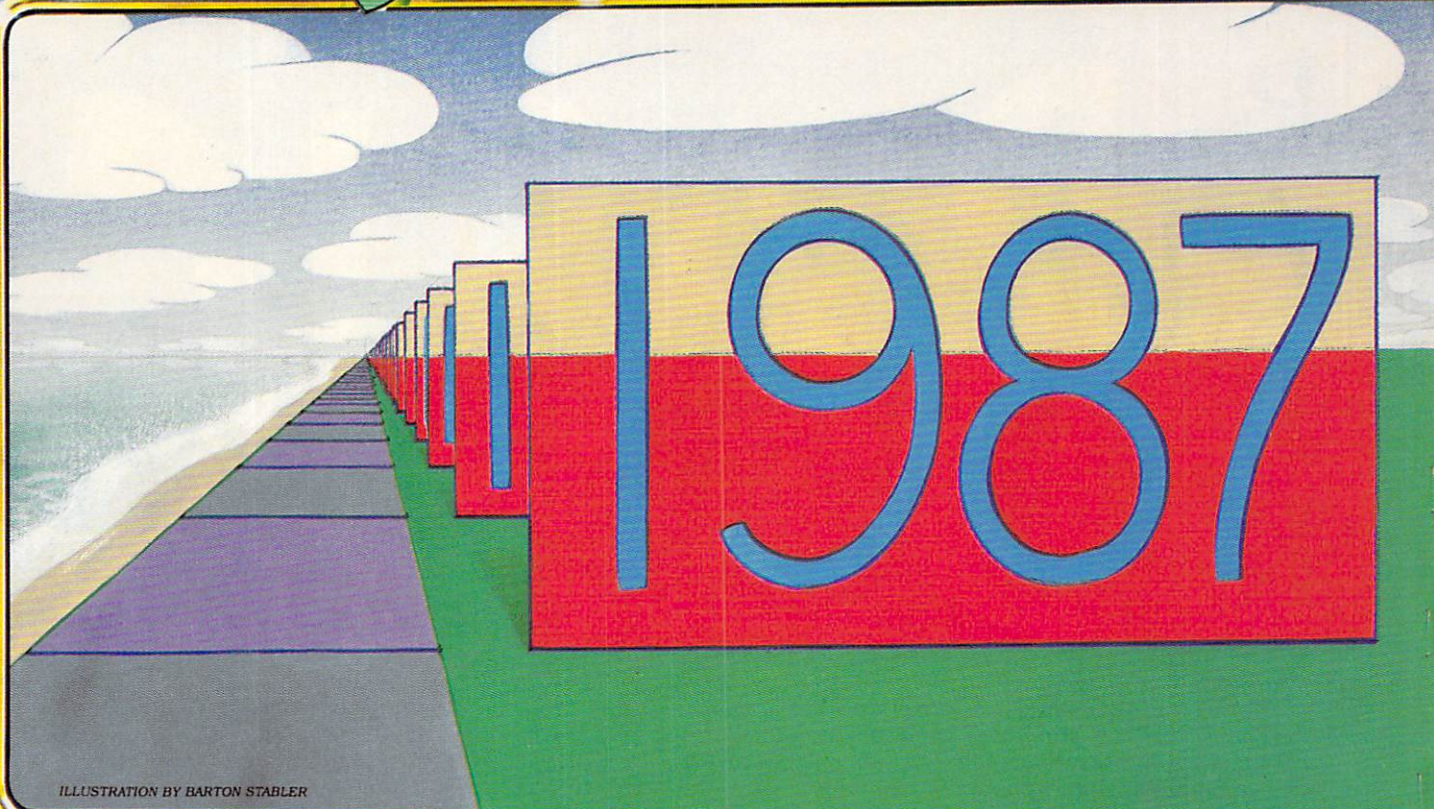


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★ J A N U A R Y ★

BEGINNER PROGRAM

Page 56

Part II of our Back to BASIC series features *Storyline*, a fun, fill-in-the-blanks story generator that sharpens your understanding of the BASIC programming language.

HOLIDAY PROGRAM

Page 72

This New Year's Eve, let your computer lead the celebrations with our 1987 program, a blast of colorful graphics to the tune of "Auld Lang Syne."

TIPS TO THE TYPIST

Page 84

How to type in FAMILY COMPUTING's programs

MORE PROGRAMS IN K-POWER

Page 116

SURVEY RESULTS

Page 82

ILLUSTRATION BY JAMES CHERRY III

Cherry

BACK TO BASIC, PART II

USE BASIC'S ARRAYS TO MAKE A COMICAL NEW STORY EVERY TIME

BY PASQUALE M. CIRULLO



Last month, "Back to BASIC" introduced eight simple BASIC commands in *Numble*, a number game for quick thinkers. In this second installment, we quickly review those commands and explain six new ones, plus the handy concept of arrays, or tables of data. Whether a computer is a new holiday addition to your family or you've just never gotten around to programming in BASIC, it's easy to start learning right here. Then check out the box "Where Do I Go From Here?" for resources that can help you on your way to mastery of BASIC.

"GIVE ME A BARNYARD ANIMAL..."

Storyline is a computerized version of a popular fill-in-the-blanks game in which one person makes up a story, leaving out several significant words. Then he or she asks a friend, "Give me a noun" or "Give me a verb," filling in the blanks in the story with each reply. Finally, the two players read the hilarious results!

In *Storyline*, the computer takes the role of the first player, and it's your job to supply the words or phrases. Then the computer fills in the blanks with the words you supplied and displays the story. You can run the program over and over again, supplying different words every time. And you only have to learn a little BASIC to be able to figure out how to change the story outline.

What's more, if you set up the story to ask for different parts of speech, it serves as a kind of grammar quiz at the

same time, producing nonsensical instead of funny results if the words you supply don't match the requested categories. For example, when *Storyline* asks for a NOUN WITH ARTICLE, do you know that you must type in a phrase beginning with either A, AN, or THE?

TYPING IN THE PROGRAM

Before typing the program into your computer, gather together all your computer manuals so you can have help nearby. Also make sure you have a disk or cassette on which to save the program after you have typed it in . . . but before you run it. (Floppy disks should be formatted, or initialized, before use. The disk-drive manual will tell you how to do this.)

Check the program titles to see which version is the correct one for your computer. Except where otherwise specified, "Apple II series" programs run under *Applesoft BASIC*. Tandy Color Computer programs, although tested under *Disk Extended Color BASIC*, should work in standard and *Extended Color BASIC* as well. Model III programs also run on Model 4's under *Model III BASIC*. And TI-99/4A programs should be run in standard, not *Extended*, *TI BASIC* unless otherwise stated.

Next, check your manuals to find out how to get into BASIC (this differs from computer to computer) and start typing! When you're done, proofread the program thoroughly, make any corrections, SAVE it to disk or tape, and then type RUN and press RETURN (some computers label this key ENTER, instead). "Tips to the Typist" in this

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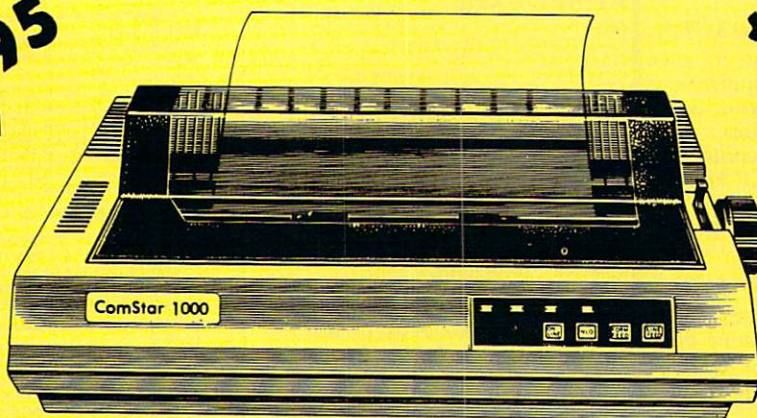
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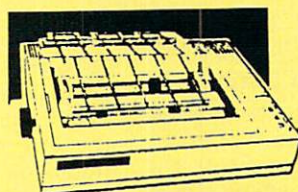
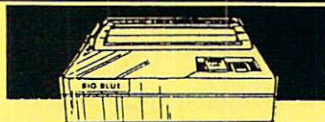
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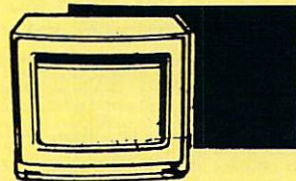
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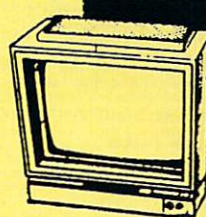
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BEGINNER PROGRAM

section gives more detailed information about typing in programs and finding errors.

Once you've enjoyed playing with your own personal copy of *Storyline*, read on; you'll discover that BASIC programs—or at least this one—aren't really so hard to understand after all.

LINE NUMBERS

Line numbers are used to tell the computer whether the line you're typing in is part of a program, or whether you want the computer to perform the command or commands on that line immediately. If there is a line number at the start of a line, the computer will save it in its memory, along with any other lines with line numbers, to be performed later (when you type RUN). If there is no line number, the computer will try to follow the command immediately. This is called the "immediate" mode.

Every line of a BASIC program (except in the most recent versions of BASIC) must have a line number at the very beginning of the line. This number tells the computer in what order the lines should be executed. A line number can be any positive whole number as long as it is lower than 64000 (32768 on the Atari).

The important thing about line numbers is that they increase from the beginning of the program to the end. The lines can be typed in any order; the computer arranges and rearranges the lines in numerical order as they're typed in.

There is no set way that a program has to be numbered. But if you use line numbers that increase by, say, 10 or 100, it makes your life a lot easier in case you forgot to put in a line or decide later to add a line. If the program is numbered 100, 110, 120, etc., then a line can easily be inserted wherever it is needed by using a line number such as 102, 103, or 115. If the program is numbered 10, 11, 12, etc., there's no room to insert new lines between any two existing ones.

VARIABLES

Nearly every program also uses variables. A variable is a sort of mailbox that the computer uses to save a single piece of information for later use. For example, if the computer calculates a formula but does not print the answer until later in a program, the answer will be stored in a variable.

You can name a variable almost anything that you want if you just follow a few simple rules.

1. A variable name must start with a letter.
2. Most computers pay attention to only the first two letters of a variable name even though they may let you use eight letters or more.
3. Certain words, such as AND, PRINT, and IF, cannot be used because they have a special meaning to BASIC. A list of these words, often called "reserved words" or "keywords," is in your BASIC manual.

Here are some legal variable names:

NUMBER
BETTY
M2
X

The following names are not legal:

2M (must start with a letter)
NAME and NANCY (each is a legal name, but most computers will treat them as the same variable because they both start with NA)
INPUT (a word reserved by BASIC)

PRESTIDIGITATION (too long for most computers to handle)

There are two different types of variables: numeric variables and string variables. Numeric variables are variables used to hold numbers. String variables are used to hold any combination of letters, numbers, and special symbols strung together in a row—called a "string." Strings are called upon when you want the computer to use words or phrases in a program. Here are some examples of strings:

"S"
"HIJKLMN"
"HI, HARRY!"
"R2D2: 10%"
"32"

Strings are always written with quotation marks; "32" is treated as a string, but 32 is treated as a number.

You must tell the computer which variables are string variables by putting a dollar sign (\$) after the variable name. Some examples are MARYS\$ and NAMES\$. Since string variables can only store strings, and numeric variables can only store numbers, the following lines will normally give you an error message:

100 X = "ABC"
200 Y\$ = 20

These lines are OK:

100 X\$ = "ABC"
200 Y = 20

Note that the equal signs (=) mean "store the value on the right in the variable on the left."

CLEARING THE SCREEN

Storyline uses eleven BASIC-reserved words to do what we want it to: HOME, PRINT, FOR/NEXT, INPUT, READ/DATA, REM, DIM, CHR\$, and END.

You'll find the HOME command or its equivalent in lines 200 and 1100 of the version of *Storyline* for your computer. This command tells the computer to clear the screen and to move the cursor to the upper left-hand corner of the screen. It's like turning to a new, blank page in your notebook and putting your pencil in the upper left-hand corner of the new sheet, ready to write. This command does not change any program or data you might have in the computer's memory (the old page is still in the notebook); it only erases the screen.

To see this in action, type a few lines to fill up your screen and press the RETURN key. Then type your computer's version of the HOME command and press RETURN again. Your screen should be erased.

WRITING ON THE SCREEN

The PRINT command, found in lines 400, 500, 800, 1200, 1300, 1600, and 1900, is perhaps the most necessary command in BASIC. It's BASIC's way of saying, "write something on the screen."

PRINT is very versatile. You can use it to make the computer skip a line. We used PRINT in this manner in lines 500 and 1300 of *Storyline* to double space the output.

You can also use PRINT to make the computer tell you the value of a variable. Just type the variable name after the word PRINT. (Lines 400, 1200, 1600, and 1900 of *Storyline* use PRINT this way.) Try typing in the following program:

10 A = 17
20 B = 9

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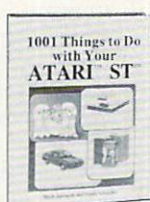
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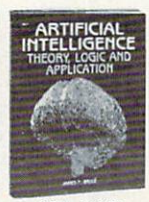
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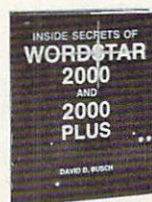
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CIRCLE READER SERVICE 60

BEGINNER PROGRAM

```
30 C=A*B
40 PRINT C
RUN
```

The computer should respond with 153, which is 17×9 . (BASIC uses the asterisk, instead of the letter x, to mean "multiply.")

The PRINT statement can also be used to write a message on the screen. Just put the message you want the computer to write in quotation marks after the word PRINT, as in line 800 of *Storyline*. Here's another example:

```
10 PRINT "HELLO,"
20 PRINT "I AM YOUR FRIENDLY COMPUTER."
RUN
```

Of course, if you PRINT a string variable, you'll also get text on the screen:

```
10 ECS="IS THERE AN ECHO IN HERE?"
20 PRINT ECS
30 PRINT ECS
RUN
```

You can print more than one item, or even more than one type of item, by listing them in order after the word PRINT, separated by semicolons. For example, line 800 of *Storyline* prints both a message (GIVE ME A) and the contents of the string variable WS. Line 1900 of *Storyline* uses a single PRINT command to display the values of two string variables, SS and AS(6), a space, and quotation marks, all on the same line.

FOR/NEXT

The FOR and NEXT commands mark the start and end of a loop—a group of commands that are executed more than once. For every FOR, there must be a matching NEXT, or the computer will tell you that you made an error.

In *Storyline*, we want the computer to perform lines 700, 800, and 900 six times (five times in the Atari version). Rather than writing them out six times, we put them in a loop, starting with the FOR statement in line 600.

The FOR statement tells the computer to start counting how many times we're going through the loop. In order to do this, we have to give the computer a numeric variable to keep track of the count (called a counter or index), a

number at which to start counting, and a number at which to stop counting. Try the following program:

```
10 FOR X=1 TO 50
20 PRINT X
30 NEXT X
40 PRINT "THE END"
RUN
```

Here, the computer will use X to count. It will start counting at 1, and it will stop counting at 50. The computer starts by setting X equal to 1. Then it performs line 20. The NEXT statement in line 30 tells the computer to go back up to the FOR statement and add 1 to the counter, making it 2. In this way, X keeps track of the number of times the computer has been through the loop. Once X exceeds 50, the computer will stop counting and go on to the line after the NEXT statement (line 40).

For more information on HOME, PRINT, and FOR/NEXT, see "Back to BASIC, Part I" in the December 1986 issue of *FAMILY COMPUTING*.

GIVING THE COMPUTER INFORMATION

We have seen how to get information out of a program (via the PRINT statement). But how can we put data in?

Two ways are by using the INPUT or the READ/DATA statements. These both supply information to a program, but they work a little differently. Use the INPUT statement if you don't know the information when you're writing the program, or if it's likely to change. READ and DATA are a handy way to include in a program large amounts of data that are known beforehand.

INPUT, used in line 900 of *Storyline*, lets you type in data from the keyboard while the program is running. The program pauses until it's given an answer. Here's an example:

```
10 PRINT "WHAT IS YOUR NAME";
20 INPUT NAMES
30 PRINT "HELLO, ";NAMES
RUN
```

The variable name after the word INPUT tells the computer where to store the data that's typed in. (In this

WHERE DO I GO FROM HERE?

If you enjoyed "Back to BASIC" and would like to learn more about BASIC programming, probably the best thing you can do is experiment. Start with working programs you've typed in from *FAMILY COMPUTING*, and change a line or two to see what happens. See if you can add your own personal flair. Then try writing your own programs that work in a similar way.

Make heavy use of your computer's BASIC manual, which is the authority on the particular version of BASIC you're using. Read up on a new command; then try it out in a simple program. And remember: If you make a mistake, you won't hurt your computer; you'll probably learn more from correcting your mistakes than you

do any other way.

If you want to see more examples of how BASIC works, here are a few places to turn:

Users Groups—Users groups are a good place to begin. The people you meet through a users group can answer many of your questions—most of them were once in your shoes—and can also suggest other sources of information on BASIC programming in your area.

The store where you bought your computer or the computer company can help you get in touch with a users group for your computer in your area.

Books & Cassettes—There are hundreds of books on the market, ranging from beginner to advanced, that will help you with BASIC. Here are

two of my favorites:

BASIC by Boillot and Horn, West Publishing Company, New York, New York, 1983.

BASIC Programming for the Classroom and Home Teacher by Chaya, Miller, and Santora, Teacher's College Press, Teacher's College, New York, New York, 1982.

Look for other titles at your local library or bookstore, especially books written for your brand of computer.

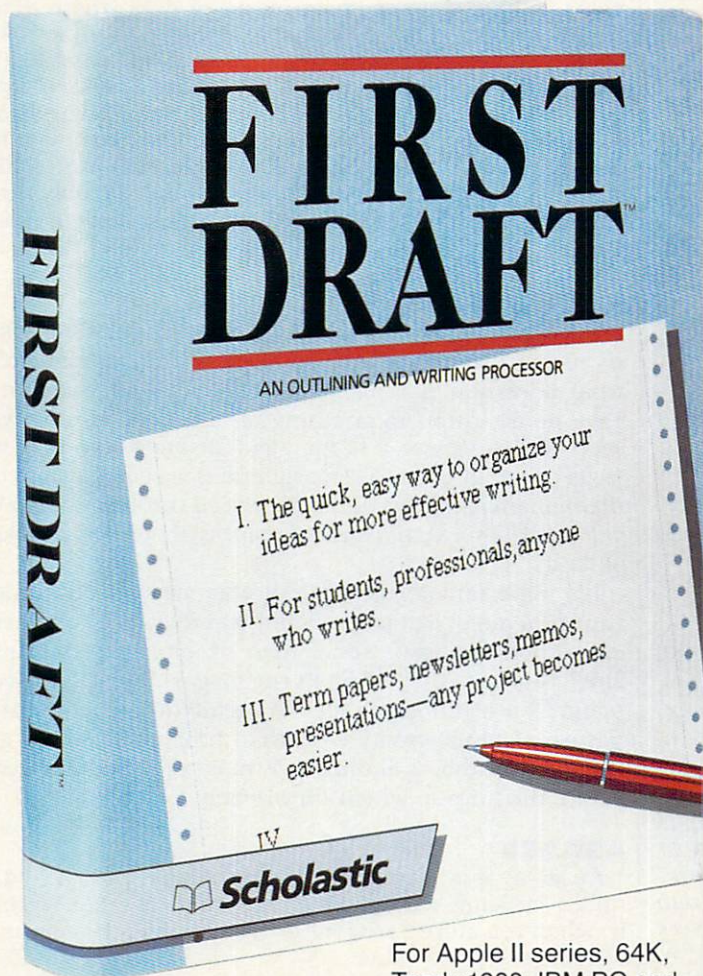
You can also find audio cassettes and videocassettes about BASIC and diskette-based courses that teach you on your own computer. And some computer games are designed to teach you programming principles.

Courses—Courses in BASIC are widely available, and some are quite reasonably priced,

or even free. Most high schools, and many junior high and elementary schools, teach BASIC. For adults, many high schools and colleges that have adult or continuing-education programs offer courses in BASIC programming. You may also want to check with your local YMCA/YWCA/YMHA, library, community or senior citizens' center, or BOCES chapter for more information.

If there's no course being given in your area, why not start one? See if you can find someone knowledgeable in BASIC who'd be willing to spend an hour or two a week helping a group of beginners along. Rounding up others who are just starting out will also give you a built-in support group.

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BEGINNER PROGRAM

case, we are using a string variable because your name is a string and not a number.) When the computer reaches line 20, it will print a question mark to let you know it wants something from you. Then it will wait for you to tell it your name (the computer will continue when you press RETURN). If you walk away from the computer and return later, the computer will still be waiting for an answer.

The INPUT statement can also be used to give the computer two pieces of data at once. Try this example:

```
10 PRINT "GIVE ME TWO NUMBERS."  
20 INPUT A,B  
30 PRINT A*B  
RUN
```

In this case, the computer will wait for two numbers. Notice that the two variables A and B are separated by a comma (.). This is the same way that you have to type in the numbers: You must separate them with a comma or the computer will wait for the second number. This same method can also be extended to include three, four, or more variables in one INPUT statement.

To store data in the program itself, use the READ and DATA statements. READ and DATA, like FOR and NEXT, must be used together. The READ statement tells the computer the name of the variable or variables in which to store the data for later use. (See lines 300, 700, 1500, and 1800 of *Storyline*.) The DATA statement tells the computer what the data is (see lines 3000 to 5300 of *Storyline*).

You can put the READ statement anywhere in the program, just so long as it's before the place where you need to use the data. When the computer sees the READ statement, it makes sure it has set aside a space for the variable and then looks for the data to store in that variable.

The computer will use the first piece of data in the lowest-numbered DATA statement first. After it has read a piece of data, the computer crosses that information out so that it does not use it again. The next time it needs to READ a piece of data, it takes the next one from that DATA statement, if any; otherwise, it moves to the next-lowest-numbered DATA statement, etc. If there are no more DATA statements, you get the common (and infamous) OUT OF DATA error.

DATA statements can be placed anywhere in the program (we placed all the DATA for *Storyline* together at the very bottom). What is important is that the data be placed in the order that you want the computer to READ it. Try this program:

```
10 FOR X=1 TO 5  
20 READ A  
30 PRINT A  
40 NEXT X  
100 DATA 5  
110 DATA 4  
120 DATA 3  
130 DATA 2  
140 DATA 1  
RUN
```

The computer will print the numbers in the same order that they appear in the DATA statements.

The computer does not care how many DATA statements there are; the important thing is that there is the proper number of pieces of data. Try this example:

```
10 FOR X=1 TO 5  
20 READ A
```

```
30 PRINT A  
40 NEXT X  
100 DATA 5,4,3,2,1  
RUN
```

The computer will still give the same output. That is because both examples have the same amount of data, even though the number of DATA statements is different.

Storyline has four READ statements. The one in line 300 has one variable, so it only needs one piece of data. The computer gets this data from line 3000. The READ statement in line 700 needs six pieces of data (there is one variable, but it is in a loop that is repeated six times). The computer gets the data from lines 4000 to 4200 (six pieces of data in three DATA statements). The READ statement in line 1500 needs five pieces of data. There is one variable in a FOR/NEXT loop that is executed five times. The computer gets the data for this variable from lines 5000 - 5200. Finally, the READ statement in line 1800 only needs one piece of data; it gets it from the DATA statement in line 5300.

A FEW REMARKS

REMARK statements (lines 2999, 3999, and 4999) allow us to put comments in a program to help us remember what a certain part of a program does. The computer pays no attention to anything on a line beginning with REM. You can place a REM statement anywhere that you feel a program needs a remark, and it's a good idea to use them liberally. In *Storyline*, we placed the REM statements before the DATA statements to identify the different pieces of data.

It's important to use REMARK statements to document your programs. But when typing in programs from magazines, you can save some time by omitting the REMS, since you have the listing in the magazine itself as documentation of the program. To highlight the informative nature of REMS, FAMILY COMPUTING programs always give them line numbers ending in 9, making them fall directly before the lines to which they refer.

ARRAYS

An array is a way of organizing related pieces of data under the same variable name, in a sort of table. Normally, when you store a new value in a variable, the computer will forget the old value:

```
20 FOR X=1 TO 4  
30 A=X  
40 NEXT X  
50 FOR Y=1 TO 4  
60 PRINT A  
70 NEXT Y  
RUN
```

Instead of printing 1, 2, 3, and 4, the computer just printed the number 4 four times. That's because every time line 30 was executed, a new value was stored in A; by the time line 50 was reached, A contained only the last value, 4.

By making A an array—a mailbox with separate, numbered subcompartments—we can store each of the four values in a different subcompartment. This is how the same example looks using an array. Notice how lines 30 and 60 have changed:

```
10 DIM A(4)  
20 FOR X=1 TO 4
```



```

30 A(X)=X
40 NEXT X
50 FOR Y=1 TO 4
60 PRINT A(Y)
70 NEXT Y
RUN

```

This time the computer gave us the numbers 1 to 4. The difference is that the computer set up four distinct subcompartments of A. It then put the first value, 1, in the first numbered subcompartment, called A(1); the second value in A(2); the third in A(3); and the fourth in A(4).

When we want to use an array, we must first tell the computer how many subcompartments the mailbox needs. We do this by using the DIMENSION statement. The DIM statement should appear before we try to use the array or we may get an error.

The DIM statement tells the computer what variable will be an array and how much space it will need. In *Storyline*, line 100 tells the computer to set up an array by the name of AS, with six subcompartments, each of which is to function as an independent "mailbox." From this point on in the program, every time we want to use this array, its name must be followed by a number in parentheses, as in AS(1), AS(2), etc. We cannot go higher than AS(6) because we told the computer that we only needed six spaces.

If we like, rather than using a number, we can use a variable (such as the counter of a FOR/NEXT loop, within the parentheses). This is especially helpful when the value of the variable is changing. For example, in lines 900 and 1600 of *Storyline*, the value of the variable within the parentheses changes every time the computer executes

the statement, so a different subcompartment, or "element," of the array is INPUT (line 900) or PRINTED (line 1600) each time through the loop.

In line 900, the INPUT statement stores the word you're asked to give into AS(X). Notice that we have X in the parentheses and not a number. This works because line 900 is inside the FOR/NEXT loop that starts at line 600 and ends at line 1000. Within this loop, X is counting from 1 to 6 (remember what a FOR statement does?).

In line 1600, we cannot use X in the parentheses because the computer is no longer using X as a counter. At this point in the program, it's using Y to keep track of how many times it's been through the loop, so we must use Y in the parentheses. When Y is equal to 1, the computer will print the word you gave it when X was equal to 1—that is, the first word you input. This process will continue until Y is equal to 5.

Line 1900 is not in a loop, so there is no counter to use for our array. We must tell the computer exactly which subcompartment, the sixth, to print, so we say AS(6).

Computers allow you to divide the mailbox into both horizontal and vertical sections, producing, say, a "two-dimensional," 4 x 4 array of 16 subcompartments . . . or even to create arrays in three, four, or more dimensions! That's what's going on when you see a DIMENSION statement that looks like this:

```
80 DIM A(4,3,21,2)
```

CHARACTERS BY THE NUMBER

Unlike the other BASIC words we've discussed so far, CHR\$ is a function, not a command. A function is a way to convert one quantity to another; for example, the INT function converts a real number like 23.78435 to an integer produced by dropping all the decimal places

 1619	 2	 HORN	 S N
 161-121-41	 two	 HORN	 S N

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(here, you'll end up with 23).

Computers store all information, even characters, as numbers. When we type in a letter or punctuation mark, the computer first converts the letter to a specific number, and then stores that number. It gets the number from a chart called the ASCII chart (see your BASIC manual for your computer's version).

The CHR\$ function (CHR is short for "character," and the dollar sign means the result of the function is a string) tells the computer to look at the chart and substitute the character that a certain number stands for. For example, type the following line:

```
PRINT CHR$(66);CHR$(65);CHR$(83);CHR$(73);CHR$(67)
```

The CHR\$ function tells the computer to convert the number within the parentheses to the appropriate character; then the PRINT command displays the results.

We had to use the CHR\$ function in line 1900 of *Storyline* because there's no other easy way to print a quotation mark. Check your ASCII table, and you'll see that the value 34 corresponds to quotes.

ENDING IT ALL

The END command in line 2000 tells the computer it has reached the end of the program and to stop working. Remember that DATA statements themselves are not executed (the corresponding READ statements are), so they can be placed anywhere in a program, even after an END statement.

HAVE IT YOUR WAY!

Now that you understand how *Storyline* works, it's time to have some fun with the program! Now you know enough BASIC to start making some changes.

When you get tired of using the basic story line we provided, you can easily change it. Start by putting your new title in line 3000. Write out your story, and remove the last word or phrase from each line. Then decide what GIVE ME A . . . question the computer should ask to get an appropriate response to be placed at the end of that line (e.g., GIVE ME A VERB (PAST TENSE) OR GIVE ME A PLACE YOU CAN SIT).

List the kinds of responses you're looking for (e.g., VERB [PAST TENSE] OR PLACE YOU CAN SIT) in DATA statements starting at line 4000. If you put more than one on a line, make sure you separate them by commas; do not put a comma at the end of a line.

Next, put each line of the story (without the last word) into a DATA statement, starting at line 5000. Finally, count how many lines your story has and adjust the DIM statement and the two FOR statements to reflect this number.

We had to include lines 1800 and 1900 in order to print quotation marks around the last response, but you may want to delete them so that the entire story is printed by the loop at lines 1400-1700.

For more of a challenge, see if you can find a way to insert the input words into the middle of the lines of your story or have more than one "blank" on a single line. Or, if you want to use a story that's too long to fit on your screen all at once, you could try writing a program that would break it up into screen-size chunks.

By playing with *Storyline* and studying our tutorial, the mysteries of the BASIC programming language (and of your own story's ending) will begin to unravel. This will leave you with useful programming tools to build with and an entertaining, ever-changing fill-in-the-blanks game to try with a friend.

MUST READING FOR ATARI OWNERS

The Atari version of *Storyline* is identical to all the others in all but one respect. The difference is the way Atari computers handle strings—chunks of text.

In Microsoft BASIC, a string variable such as TS can be used to store a string of any length, from 0 to the computer's maximum (usually 255). In contrast, Atari BASIC will allow a string to reach enormous proportions (up to 32K characters!), but you must specify the length of the string using a DIM statement.

For example, in Atari BASIC, the command DIM AS(40) allocates space for a string called AS up to 40 characters long. The maximum length of each string variable must be "declared" in this way before it can be used.

In Microsoft BASIC, the same command, DIM AS(40), tells the computer to create an array of 40 different strings each, of which can be up to the computer's maximum. Individual string variables, like TTS in *Storyline*, need not be "declared."

The major consequence of this difference between the two BASICs is the way you refer to a subsection of a string, or a substring, such as the characters ITT in LITTLE. Microsoft BASIC has functions called LEFT\$(), MID\$(), and RIGHT\$() for this purpose. For example, MID\$("EATING", 2, 4) is ATIN, because the 2 means to start with the second character of EATING and the 4 means to take four characters from there . . . A, T, I, and N.

In Atari BASIC, you specify a substring by adding two numbers in parentheses to the name of the variable. The first number tells the computer where in the string to start, and the second tells the computer where to stop. So if DS="EATING", then DS(2,5) is ATIN because A is the second character of EATING and N is the fifth character.

Thus the program:

```
10 AS="WELCOME TO NEW MEXICO"
```

```
20 PRINT MID$(AS,4,8);MID$(AS,16,6)
```

in Microsoft BASIC and the program

```
10 DIM AS(21)
```

```
20 AS="WELCOME TO NEW MEXICO"
```

```
30 PRINT AS(4,11);AS(16,21)
```

in Atari BASIC both print COME TO MEXICO.

Although Atari BASIC does not provide for string arrays, they can be simulated. Here's how: Guess how long the largest string you want to store in your "array" will be and multiply this number by the number of array "elements" that you want. Then dimension one long string. In *Storyline*, we need five "elements," the longest of which will be 22 characters, AS is set to 110 characters (22 × 5). Then, using Atari's substring notation, we can refer to the first string as AS(1,22), the second as AS(23,44), and so on. A formula that gives us these numbers is AS(Y*22-21,Y*22), where Y is 1, 2, 3, 4, and 5; see line 1600 of *Storyline*.

The only problem with this method is that each string will be the length of the longest string (here, 22). So you have to fill the entire string with spaces (lines 210-230 of *Storyline*) before you begin to make sure there are no "garbage" characters left in AS if some of the strings you put in AS are shorter than 22 characters long.

Another problem that arises from Atari string arrays is that you can only INPUT an entire string, not just a section. (For example, INPUT CS is legal, but INPUT CS(1,5) is not.) To solve this, we use lines 900-910. In line 900, we INPUT our response into Z\$. Then we transfer Z\$ to AS in line 910. The function LEN() in line 910 determines the length of the Z\$. For example, LEN("FAMILY") is 6.

The additional variable PHRASES is used for the sixth string you input, the "witty saying", because if it were stored as one of the six 22-character-long strings in AS, it would be padded with spaces if it were shorter than 22 characters. Then, in line 1900, the final quotation would be printed after the last of the spaces, like this: "THAT'S ALL FOLKS!"

—STEVE FEINSTEIN

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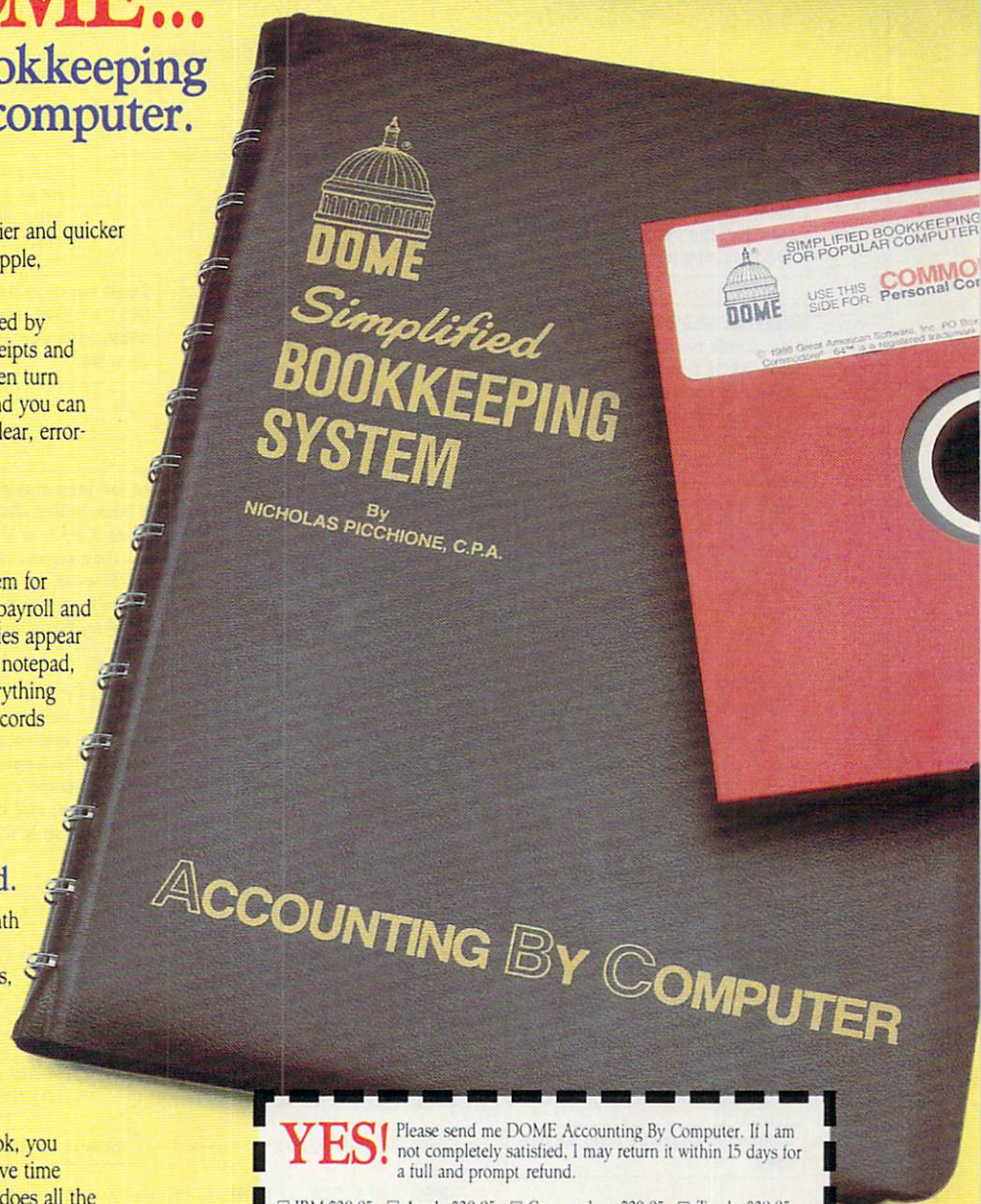
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THE ANATOMY OF A PROGRAM

Apple II series/Storyline

Tell the computer we are using an array named A\$ that will need to store six different values.

PRINT (display on the TV or monitor) the value of variable TT\$ (e.g., the title of the story).

Start a FOR/NEXT loop to accept six words or phrases as they are INPUT from the keyboard. X assumes the values 1 to 6 as the first through sixth word or phrase is accepted.

Wait for a word or phrase to be INPUT at the keyboard; then store it as the Xth value in the array A\$.

Clear the screen.

PRINT the contents of variable TT\$ (e.g., the title of the story).

Skip a line.

READ the next DATA item (LITTLE, etc.) from lines 5000-5200 and place it in variable S\$.

End the loop started in line 1400: Go back to line 1400 and increase Y by 1. If Y is still 5 or less, then repeat the loop again from line 1500; if Y is now greater than 5, proceed to the line following this one (line 1800).

REMARK to describe data on line 3000.

REMARK to describe data on lines 5000-5300.

DATA to be READ by line 1500.

100 DIM A\$(6)

200 HOME

300 READ TT\$

400 PRINT TT\$

500 PRINT

600 FOR X = 1 TO 6

700 READ W\$

800 PRINT "GIVE ME A ";W\$;

900 INPUT A\$(X)

1000 NEXT X

1100 HOME

1200 PRINT TT\$

1300 PRINT

1400 FOR Y = 1 TO 5

1500 READ S\$

1600 PRINT S\$;" ";A\$(Y)

1700 NEXT Y

1800 READ S\$

1900 PRINT S\$;" ";CHR\$(34);A\$(6);CHR\$(34)

2000 END

2999 REM --TITLE--

3000 DATA A MEAL TO REMEMBER

3999 REM --WORDS--

4000 DATA BOY'S NAME,NOUN WITH ARTICLE,KIND OF FOOD

4100 DATA PART OF THE BODY,NOUN WITH ARTICLE

4200 DATA WITTY SAYING

4999 REM --STORY--

5000 DATA LITTLE,SAT IN

5100 DATA EATING HIS,HE STUCK IN HIS

5200 DATA AND PULLED OUT

5300 DATA AND SAID

Clear the screen.

READ the first DATA item, A MEAL TO REMEMBER, from line 3000 and place it in variable TT\$.

Skip a line.

READ the next DATA item (BOY'S NAME, etc.) from lines 4000-4200 and place it in variable W\$.

PRINT the words GIVE ME A followed by the contents of variable W\$. Do not move down to the next line on the screen.

End the loop started in line 600: Go back to line 600 and increase X by 1. If X is still 6 or less, then repeat the loop again from line 700; if X is now greater than 6, proceed to the line following this one (line 1100).

Start a FOR/NEXT loop to print the first five lines of the story. Y assumes the values 1 to 5 as the first through fifth lines of the story, respectively, are printed.

PRINT the contents of the variable S\$ (the beginning of the next line of the story), leave a blank space, and then PRINT the Yth value in the array A\$.

READ the last DATA item, AND SAID, from line 5300 and place it in variable S\$.

PRINT the contents of variable S\$ (the beginning of the last line of the story), leave a blank space; then print a quote ("), the 6th value in the array A\$, and another quote (").

End the program.

DATA to be READ by line 300.

REMARK to describe data on lines 4000-4200.

DATA to be READ by line 700.

DATA to be READ by line 1800.

BEGINNER PROGRAM

Atari 400/800, 600/800XL, & 130XE/Storyline

```
100 DIM A$(110),PHRASE$(29),S$(15)
110 DIM TT$(18),W$(17),Z$(22)
200 PRINT CHR$(125);
210 FOR Y=1 TO 110
220 A$(Y)=CHR$(32)
230 NEXT Y
300 READ TT$
400 PRINT TT$
500 PRINT
600 FOR X=1 TO 5
700 READ W$
800 PRINT "GIVE ME A ";W$;
900 INPUT Z$
910 A$(X*22-21,X*22-20+LEN(Z$))=Z$
1000 NEXT X
1010 READ W$
1020 PRINT "GIVE ME A ";W$;
1030 INPUT PHRASE$
1100 PRINT CHR$(125);
1200 PRINT TT$
1300 PRINT
1400 FOR Y=1 TO 5
1500 READ S$
1600 PRINT S$;" ";A$(Y*22-21,Y*22)
1700 NEXT Y
1800 READ S$
1900 PRINT S$;" ";CHR$(34);PHRASE$;CHR$(34)
2000 END
2999 REM --TITLE--
3000 DATA A MEAL TO REMEMBER
3999 REM --WORDS--
4000 DATA BOY'S NAME,NOUN WITH ARTICLE,KIND OF FOOD
4100 DATA PART OF THE BODY,NOUN WITH ARTICLE
4200 DATA WITTY SAYING
4999 REM --STORY--
5000 DATA LITTLE,SAT IN
5100 DATA EATING HIS,HE STUCK IN HIS
5200 DATA AND PULLED OUT
5300 DATA AND SAID
```

Commodore 64 & 128/Storyline

```
100 DIM A$(8)
200 PRINT CHR$(147);
300 READ TT$
400 PRINT TT$
500 PRINT
600 FOR X=1 TO 6
700 READ W$
800 PRINT "GIVE ME A ";W$;
900 INPUT A$(X)
1000 NEXT X
1100 PRINT CHR$(147);
1200 PRINT TT$
1300 PRINT
1400 FOR Y=1 TO 5
1500 READ S$
1600 PRINT S$;" ";A$(Y)
1700 NEXT Y
1800 READ S$
1900 PRINT S$;" ";CHR$(34);A$(6);CHR$(34)
2000 END
2999 REM --TITLE--
3000 DATA A MEAL TO REMEMBER
3999 REM --WORDS--
4000 DATA NAME,NOUN WITH ARTICLE,KIND OF FOOD
4100 DATA PART OF THE BODY,NOUN WITH ARTICLE
4200 DATA WITTY SAYING
4999 REM --STORY--
5000 DATA LITTLE,SAT IN
5100 DATA EATING HIS,HE STUCK IN HIS
5200 DATA AND PULLED OUT
5300 DATA AND SAID
```

IBM PC & compatibles, Macintosh, & Tandy Models III & 4/Storyline

This program has been tested and found to work on the following computers and hardware configurations using the BASICS shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome Printer card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. Macintosh w/Microsoft BASIC 2.0 or 2.1. Tandy Models III & 4 (Model III mode) w/Disk BASIC. It should also work on many other PC compatibles.

```
100 DIM A$(6)
200 CLS
300 READ TT$
400 PRINT TT$
500 PRINT
600 FOR X=1 TO 6
700 READ W$
800 PRINT "Give me a ";W$;
900 INPUT A$(X)
1000 NEXT X
1100 CLS
1200 PRINT TT$
1300 PRINT
1400 FOR Y=1 TO 5
1500 READ S$
1600 PRINT S$;" ";A$(Y)
1700 NEXT Y
1800 READ S$
1900 PRINT S$;" ";CHR$(34);A$(6);CHR$(34)
2000 END
2999 REM --TITLE--
3000 DATA A Meal To Remember
3999 REM --WORDS--
4000 DATA boy's name,noun with article,kind of food
4100 DATA part of the body,noun with article
4200 DATA witty saying
4999 REM --STORY--
5000 DATA Little,Sat in
5100 DATA Eating his,He stuck in his
5200 DATA And pulled out
5300 DATA And said
```

Tandy Color Computer/Storyline

```
100 DIM A$(6)
200 CLS
300 READ TT$
400 PRINT TT$
500 PRINT
600 FOR X=1 TO 6
700 READ W$
800 PRINT "GIVE ME A "
810 PRINT W$;
900 INPUT A$(X)
1000 NEXT X
1100 CLS
1200 PRINT TT$
1300 PRINT
1400 FOR Y=1 TO 5
1500 READ S$
1600 PRINT S$;" ";A$(Y)
1700 NEXT Y
1800 READ S$
1900 PRINT S$;" ";CHR$(34);A$(6);CHR$(34)
2000 END
2999 REM --TITLE--
3000 DATA A MEAL TO REMEMBER
3999 REM --WORDS--
4000 DATA BOY'S NAME,NOUN WITH ARTICLE,KIND OF FOOD
4100 DATA PART OF THE BODY,NOUN WITH ARTICLE
4200 DATA WITTY SAYING
4999 REM --STORY--
5000 DATA LITTLE,SAT IN
5100 DATA EATING HIS,HE STUCK IN HIS
5200 DATA AND PULLED OUT
5300 DATA AND SAID
```


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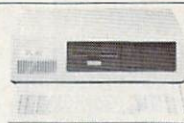


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COUNTDOWN TO 1987

BY JOEY LATIMER

New Year's Eve is a time for celebration, but don't leave your computer out in the cold. With our 1987 program, your computer can join the party! Type in the program exactly as shown, and SAVE it to disk or tape. Or, if you SAVED our 1985 version to disk, you need only change line 2030 (line 1030 for the Apple, TI-99/4A, and Models III/4 versions) to update the program. When you RUN the program, the computer will ask you to enter the current time in hours, minutes, and seconds. Enter the time in six digits, without any intervening spaces or punctuation (example: 9:55:02 p.m. is entered as 095502), and press RETURN or ENTER. You can then watch the minutes count down to an explosive and musical welcome for the new year. (The traditional New Year's song "Auld Lang Syne" will not play on the Tandy Model III version).

It is best if you test the program before the hour of midnight. That way you



can correct any typing errors that could spoil the spectacular effect. You will also be able to test the accuracy of the countdown. You may find that the closer to midnight you begin the countdown, the more exact the timing of the program's New Year cheer.

Adam/1987

```

10 LOMEM: 29000:fl = 0
20 DIM bin(7),lt(30),f(30),s(30),d(30)
30 FOR x = 0 TO 7:bin(x) = 2^x:NEXT x
40 FOR x = 1 TO 29:READ lt(x):NEXT x
50 FOR x = 1 TO 30:READ f(x),s(x),d(x):NEXT x
60 FOR x = 28000 TO 28005:READ ml:POKE x,ml:NEXT x
70 POKE 28006,255:CALL 28000
80 HOME:PRINT "TO SET THE COMPUTER CLOCK,"
90 PRINT "PLEASE INPUT THE TIME IN"
100 PRINT "HOURS, MINUTES, AND SECONDS"
110 PRINT "(E.G., 095502); THEN PRESS"
120 PRINT "<RETURN>":PRINT
130 INPUT "WHAT TIME IS IT NOW?";tim$
140 IF LEN(tim$) <> 6 THEN 80
150 ts = 0:FOR x = 1 TO 6
160 IF VAL(MID$(tim$,x,1)) = 0 AND MID$(tim$,x,1) <> "
0" THEN ts = 0:x = 6
170 NEXT x:IF ts = 1 THEN 80
180 hrs = VAL(LEFT$(tim$,2))
190 min = VAL(MID$(tim$,3,2))
200 sec = VAL(RIGHT$(tim$,2))
210 IF hrs < 1 OR hrs > 12 OR min < 0 OR min > 59 OR s
ec < 0 OR sec > 59 THEN 80
220 tim = hrs*3600+min*60+sec:HOME
230 IF tim >= 43195 AND tim <= 43200 THEN 320
240 FOR de = 1 TO 908:NEXT de:tim = tim+1
250 hrs = INT(tim/3600)
260 min = INT((tim-hrs*3600)/60)

```

```

270 sec = tim-hrs*3600-min*60
280 HTAB 13:VTAB 10
290 PRINT STR$(hrs);":";CHR$(48*(min < 10));STR$(min);
300 PRINT "":CHR$(48*(sec < 10));STR$(sec);" "
310 GOTO 230
320 GR
330 FOR x = 700 TO 100 STEP -10
340 pitch = 112406/x:two = INT(pitch/16)
350 one = 128+pitch-(two*16)
360 POKE 28006,one:CALL 28000:POKE 28006,two
370 CALL 28000:POKE 28006,144:CALL 28000
380 FOR d = 1 TO 70-(x/10):NEXT d,x:POKE 28006,159
390 CALL 28000:FOR x = 1 TO 50:GOSUB 1000:NEXT x
400 COLOR= INT(RND(1)*15)+1
410 FOR bitmap = 1 TO 29:l = lt(bitmap)
420 FOR q = 7 TO 0 STEP -1:IF l < bin(q) THEN 490
430 l = l-bin(q)
440 IF fl = 1 THEN COLOR= INT(RND(1)*15)+1
450 VLIN 4*(7-q)+2,4*(7-q)+3 AT bitmap+4
460 IF fl = 1 THEN COLOR= INT(RND(1)*15)+1
470 VLIN 4*(7-q)+4,4*(7-q)+5 AT bitmap+4
480 GOSUB 1000
490 NEXT q,bitmap
500 FOR x = 1 TO 30:POKE 28006,f(x)
510 CALL 28000:POKE 28006,s(x):CALL 28000
520 POKE 28006,144:CALL 28000
530 FOR de = 1 TO d(x)*200:NEXT de
540 POKE 28006,159:CALL 28000:NEXT x
550 fl = NOT fl:GOTO 330
1000 POKE 28006,240:CALL 28000
1010 POKE 28006,228:CALL 28000
1020 FOR de = 1 TO 20:NEXT de
1040 POKE 28006,255:CALL 28000:RETURN
2000 DATA 0,0,129,255,1,0,0
2010 DATA 0,224,160,161,255,1,0,0
2020 DATA 0,239,145,145,239,0,0,0
2030 DATA 128,128,128,129,255,1
3000 DATA 141,35,2,141,26,3,135,28,1,141,26,2,132,21,2
3010 DATA 142,23,3,133,25,1,142,23,2,132,21,1,142,23,1
3020 DATA 141,26,3,141,26,1,132,21,2,142,17,2,143,15,6
3030 DATA 143,15,2,142,17,3,132,21,1,132,21,2,141,26,2
3040 DATA 142,23,3,133,25,1,142,23,2,132,21,1,142,23,1
3050 DATA 141,26,3,142,31,1,142,31,2,141,35,2,141,26,6
4000 DATA 58,102,109,211,255,201

```

Apple II series/1987

```

10 DIM BIN(8),LT(29),N(30),D(30):FL = 0
20 FOR X = 0 TO 7:BIN(X) = 2^X:NEXT X
30 FOR X = 1 TO 29:READ LT(X):NEXT X
40 FOR X = 1 TO 30:READ N(X),D(X):NEXT X
50 FOR X = 0 TO 28:READ ML:POKE 768+X,ML:NEXT X
60 HOME:PRINT "TO SET THE COMPUTER CLOCK, PLEASE"
70 PRINT "INPUT THE TIME IN HOURS, MINUTES,"
80 PRINT "AND SECONDS (E.G., 095502);"
90 PRINT "THEN PRESS <RETURN>":PRINT
100 INPUT "WHAT TIME IS IT NOW? ";TIM$
110 IF LEN(TIM$) <> 6 THEN 60
120 TS = 0:FOR X = 1 TO 6
130 IF VAL(MID$(TIM$,X,1)) = 0 AND MID$(TIM$,X,1) <> "
0" THEN TS = 1:X = 6
140 NEXT X
150 IF TS = 1 THEN 60
160 HRS = VAL(LEFT$(TIM$,2)):MIN = VAL(MID$(TIM$,3,2))
170 SEC = VAL(RIGHT$(TIM$,2))
180 IF HRS < 1 OR HRS > 12 OR MIN < 0 OR MIN > 59 OR S
EC < 0 OR SEC > 59 THEN 60
190 TIM = HRS*3600+MIN*60+SEC:HOME
200 IF TIM >= 43195 AND TIM <= 43200 THEN 300
210 FOR DE = 1 TO 561:NEXT DE
220 TIM = TIM+1:IF TIM >= 46800 THEN TIM = 3600
230 HRS = INT(TIM/3600)
240 MIN = INT((TIM-HRS*3600)/60)
250 SEC = TIM-HRS*3600-MIN*60
260 HTAB 17:VTAB 10

```


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HOLIDAY PROGRAM

```

270 PRINT STR$(HRS);":":CHR$(48*(MIN < 10));STR$(MIN);
280 PRINT "":CHR$(48*(SEC < 10));STR$(SEC);" "
290 GOTO 200
300 HOME:GR
310 FOR X = 2 TO 151:POKE 8,X
320 POKE 6,5:CALL 768:NEXT X
330 FOR X = 1 TO 50:A = PEEK(-16336)
340 FOR D = 1 TO INT(RND(1)*5)+1:NEXT D
350 NEXT X:COLOR= INT(RND(1)*15)+1
360 FOR BITMAP = 1 TO 29:L = LT(BITMAP)
370 FOR Q = 7 TO 0 STEP -1:IF L < BIN(Q) THEN 440
380 L = L-BIN(Q)
390 IF FL = 1 THEN COLOR= INT(RND(1)*15)+1
400 VLIN 4*(7-Q)+4,4*(7-Q)+5 AT BITMAP+5
410 IF FL = 1 THEN COLOR= INT(RND(1)*15)+1
420 VLIN 4*(7-Q)+6,4*(7-Q)+7 AT BITMAP+5
430 A = PEEK(-16336)
440 NEXT Q:NEXT BITMAP
450 FOR X = 1 TO 30:POKE 8,N(X):POKE 6,D(X)*25
460 CALL 768:NEXT X:FL = NOT FL:GOTO 310
1000 DATA 0,0,129,255,1,0,0
1010 DATA 0,224,160,161,255,1,0,0
1020 DATA 0,239,145,145,239,0,0,0
1030 DATA 128,128,128,129,255,1
2000 DATA 121,2,91,3,96,1,91,2,72,2,81,3
2010 DATA 85,1,81,2,72,1,81,1,91,3,91,1
2020 DATA 72,2,60,2,53,6,53,2,60,3,72,1
2030 DATA 72,2,91,2,81,3,85,1,81,2,72,1
2040 DATA 81,1,91,3,108,1,108,2,121,2,91,6
3000 DATA 165,8,74,133,10,164,8,173,48,192,136,234
3010 DATA 234,208,251,165,7,56,229,10,133,7,176,237
3020 DATA 198,6,208,233,96

```

Atari 400/800, 600/800XL, & 130XE/1987

```

10 DIM BIN(7),TIMS(6):FL=1
20 FOR X=0 TO 7:BIN(X)=2^X:NEXT X
30 PRINT CHR$(125);"TO SET THE COMPUTER CLOCK, PLEASE"
40 PRINT "INPUT THE TIME IN HOURS, MINUTES,"
50 PRINT "AND SECONDS (E.G., 095502);"
60 PRINT "THEN PRESS <RETURN>." :PRINT
70 PRINT "WHAT TIME IS IT NOW?";
80 TRAP 30:INPUT TIMS:POKE 20,0
90 HRS=VAL(TIM$(1,2)):MIN=VAL(TIM$(3,4))
100 SEC=VAL(TIM$(5,6))
110 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR SEC>59 THEN 30
120 TIM=HRS*3600+MIN*60+SEC:GRAPHICS 2+16:TRAP 40000
130 IF TIM=43195 AND TIM<=43200 THEN 210
140 IF PEEK(20)<60 THEN 140
150 POKE 20,0:TIM=TIM+1:IF TIM>=46800 THEN TIM=3600
160 HRS=INT(TIM/3600):MIN=INT((TIM-HRS*3600)/60)
170 SEC=TIM-HRS*3600-MIN*60:TIMS="":00:00"
180 TIMS(3-(MIN>9),3)=STR$(MIN)
190 TIMS(6-(SEC>9),6)=STR$(SEC)
200 POSITION 6,5:PRINT #6;STR$(HRS);TIMS;" " :GOTO 130
210 GRAPHICS 3+16
220 FOR X=0 TO 151:SOUND 1,X,10,10
230 FOR DELAY=1 TO 5:NEXT DELAY:NEXT X
240 SOUND 1,121,8,15
250 FOR X=1 TO 10:GOSUB 1000:NEXT X:SOUND 1,0,0,0
260 FOR BITMAP=3 TO 32:READ L
270 FOR Q=7 TO 0 STEP -1:IF L<BIN(Q) THEN 310
280 L=L-BIN(Q):COLOR FL+1:PLOT BITMAP,2*(7-Q)+4
290 COLOR 2:PLOT BITMAP,2*(7-Q)+5:SOUND 1,30,8,10
300 SOUND 1,0,0,0
310 NEXT Q:NEXT BITMAP
320 FOR X=1 TO 31:READ N,D:GOSUB 1000
330 SOUND 1,0,0,0:SOUND 1,N,10,10
340 FOR DELAY=1 TO D:NEXT DELAY:NEXT X
350 FL= NOT FL:RESTORE :GOTO 220
1000 I1=INT(RND(0)*15)+1:I2=INT(RND(0)*14)+1
1010 I2=I1+I2-15*((I1+I2)>15):FG1=INT(RND(0)*16)
1020 FG2=FG1+I1-16*((FG1+I1)>15)
1030 BG=FG1+I2-16*((FG1+I2)>15)

```

```

1040 SETCOLOR 0,FG1,INT(RND(0)*9)+6
1050 SETCOLOR 1,FG2,INT(RND(0)*9)+6
1060 SETCOLOR 4,BG,INT(RND(0)*5):RETURN
2000 DATA 0,0,129,255,1,0,0
2010 DATA 0,224,160,161,255,1,0,0
2020 DATA 0,239,145,145,239,0,0,0
2030 DATA 128,128,128,129,255,1
3000 DATA 121,30,91,55,96,5,91,30,72,30,81,55
3010 DATA 85,5,81,30,72,5,81,5,91,55,91,5
3020 DATA 72,30,60,30,53,155,53,30,60,55,72,5
3030 DATA 72,30,91,30,81,55,85,5,81,30,72,5
3040 DATA 81,5,91,55,108,5,108,30,121,30
3050 DATA 91,130,0,30

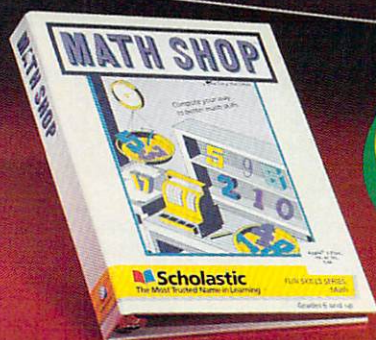
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Commodore 64 & 128 (C 64 mode)/1987

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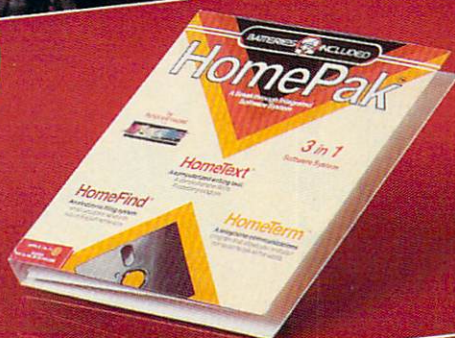
10 DIM BIN(7),LT(19),H(30),L(30),D(30),CR(5)
20 FOR X=0 TO 7:BIN(X)=2^X:NEXT X
30 FOR X=54272 TO 54296:POKE X,0:NEXT X
40 FOR X=1 TO 19:READ LT(X):NEXT X
50 FOR X=1 TO 30:READ H(X),L(X),D(X):NEXT X
60 READ CR(1),CR(2),CR(3),CR(4),CR(5)
70 FL=0:BG=INT(RND(0)*16)
80 POKE 54296,15:POKE 54277,120:POKE 54278,100
90 PRINT CHR$(147);"TO SET THE COMPUTER CLOCK, PLEASE"
100 PRINT "INPUT THE TIME IN HOURS, MINUTES,"
110 PRINT "AND SECONDS (E.G., 095502); THEN"
120 PRINT "PRESS <RETURN>." :PRINT
130 INPUT "WHAT TIME IS IT NOW?";TS
140 IF LEN(TS)>6 THEN 90
150 TS=0:FOR X=1 TO 6
160 IF VAL(MID$(TS,X,1))=0 AND MID$(TS,X,1)<>"0" THEN TS=1:X=6
170 NEXT X
180 IF TS=1 THEN 90
190 HRS=VAL(LEFT$(TS,2)):MIN=VAL(MID$(TS,3,2))
200 SEC=VAL(RIGHT$(TS,2))
210 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR SEC>59 THEN 90
220 TIS=TS:PRINT CHR$(147);
230 IF VAL(TIS)>=115955 AND VAL(TIS)<=120000 THEN 280
240 IF TIS="130000" THEN TIS="010000"
250 ZR=(LEFT$(TIS,1))="0"
260 PRINT CHR$(19);TAB(16);MID$(TIS,ZR+1,2-ZR);":":
270 PRINT MID$(TIS,3,2);":":RIGHT$(TIS,2);" " :GOTO 230
280 PRINT CHR$(147);:POKE 54276,33
290 FOR X=100 TO 0 STEP -0.5:POKE 54273,X
300 FOR D=1 TO 5:NEXT D:NEXT X:POKE 54276,129
310 FOR X=1 TO 50:POKE 54273,RND(0)*255
320 GOSUB 1000:POKE 53281,CO:NEXT X:BG=CO:GOSUB 1000
330 CH=CR(1-FL*(INT(RND(0)*4)+1))
340 FOR BITMAP=1 TO 37 STEP 2:L=LT((BITMAP+1)/2)
350 FOR Q=7 TO 0 STEP -1:IF L<BIN(Q) THEN 430
360 L=L-BIN(Q):POKE 54276,129:SC=1183+BITMAP+80*(7-Q)
370 POKE SC,CH:POKE SC+1,CH:POKE SC+40,CH
380 POKE SC+41,CH
390 IF FL THEN GOSUB 1000
400 CL=55455+BITMAP+80*(7-Q):POKE CL,CO:POKE CL+1,CO
410 IF FL THEN GOSUB 1000
420 POKE CL+40,CO:POKE CL+41,CO:POKE 54276,0
430 NEXT Q:NEXT BITMAP
440 BG=CO:POKE 54276,33
450 FOR X=1 TO 30:GOSUB 1000:POKE 53281,CO
460 POKE 54272,L(X):POKE 54273,H(X)
470 FOR D=1 TO D(X)*100:NEXT D:NEXT X
480 FL=NOT FL:GOTO 290
1000 P=INT(RND(0)*14)+1:CO=BG+P+16*((BG+P)>15):RETURN
2000 DATA 0,128,255,0
2010 DATA 224,160,160,255,0,0
2020 DATA 239,145,145,239,0
2030 DATA 128,128,128,255
3000 DATA 16,195,2,22,96,3,21,31,1,22,96,2,28,49,2
3010 DATA 25,30,3,23,181,1,25,30,2,28,49,1,25,30,1

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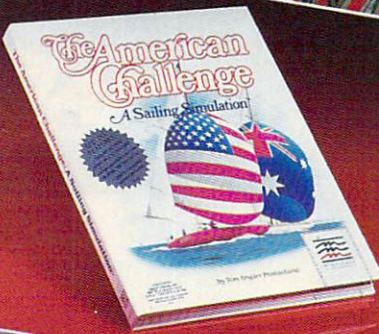
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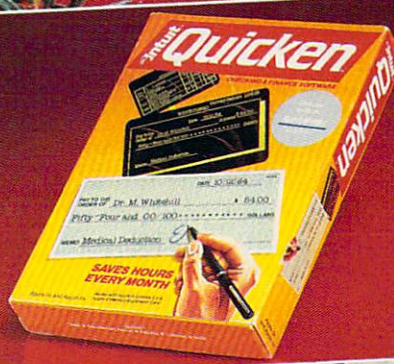
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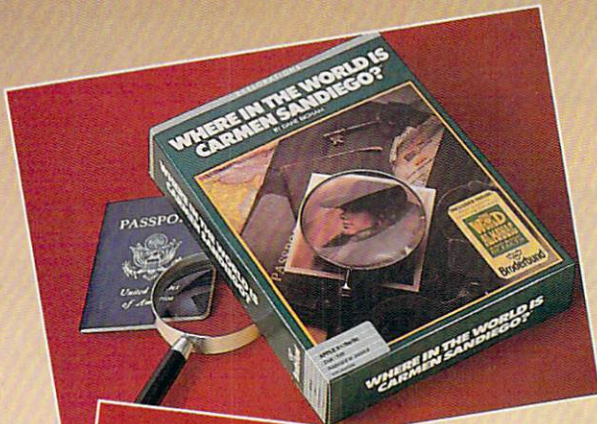


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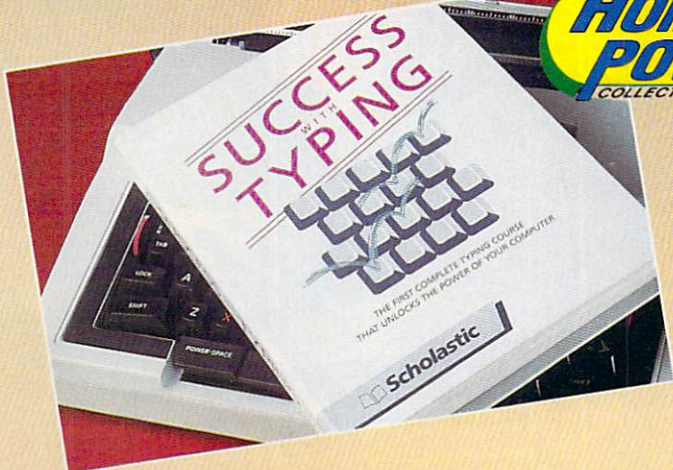
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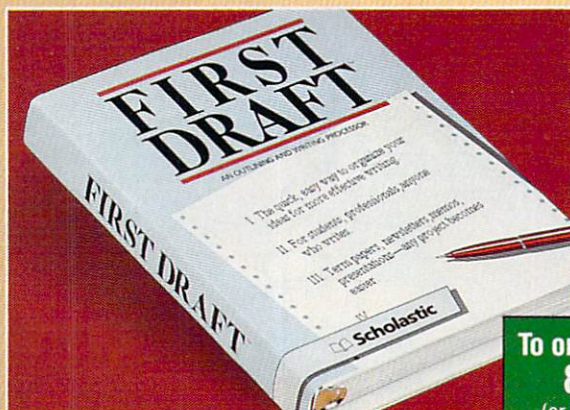
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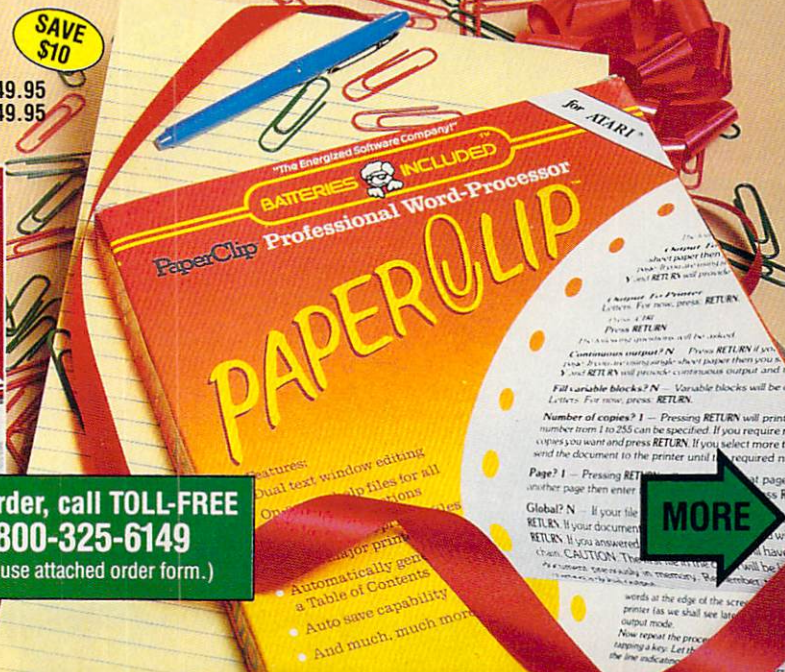
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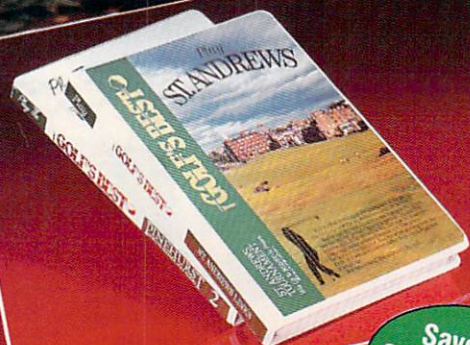
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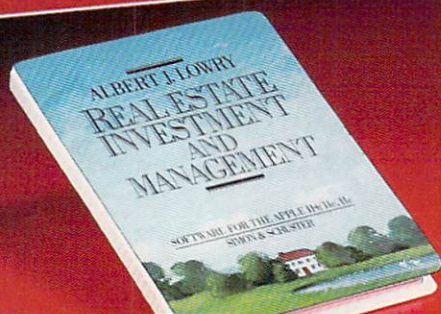
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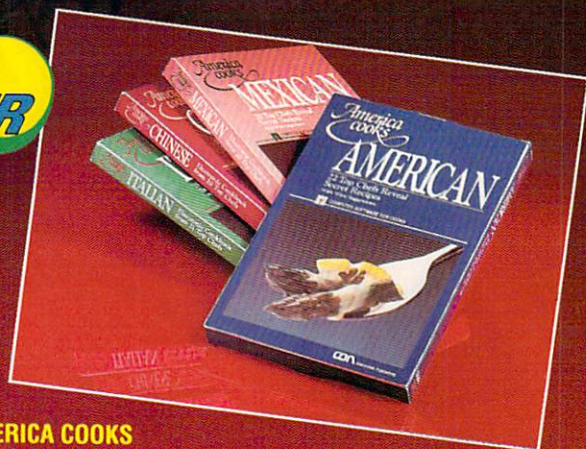
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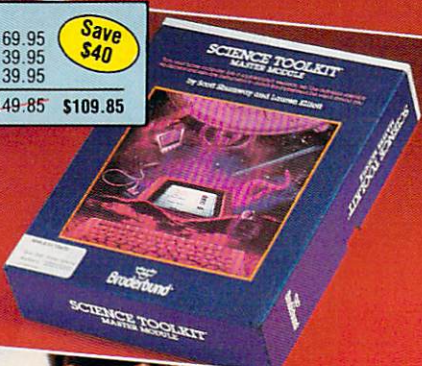
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```
3020 DATA 22,96,3,22,96,1,28,49,2,33,135,2,37,162,6
3030 DATA 37,162,2,33,135,3,28,49,1,28,49,2,22,96,2
3040 DATA 25,30,3,23,181,1,25,30,2,28,49,1,25,30,1
3050 DATA 22,96,3,18,209,1,18,209,2,16,195,2,22,96,6
4000 DATA 160,81,102,42,90
```

IBM PC & compatibles/1987

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/ColorGraphics Monitor Adapter, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 DIM BIN(7),LT(29),N(30),D(30),CR(5)
20 FOR X=0 TO 7:BIN(X)=2^X:NEXT X
30 FOR X=1 TO 29:READ LT(X):NEXT X
40 FOR X=1 TO 30:READ N(X),D(X):NEXT X
50 READ CR(1),CR(2),CR(3),CR(4),CR(5)
60 FL=0:WIDTH 40:SCREEN 0,1:COLOR 1,7:KEY OFF
70 CLS:PRINT "TO SET THE COMPUTER CLOCK, PLEASE"
80 PRINT "INPUT THE TIME IN HOURS, MINUTES,"
90 PRINT "AND SECONDS (E.G., 095502):"
100 PRINT "THEN PRESS <ENTER>." :PRINT
110 INPUT "WHAT TIME IS IT NOW";TS
120 IF LEN(TS)<>6 THEN 70
130 TS=0:FOR X=1 TO 6
140 IF VAL(MID$(TS,X,1))=0 AND MID$(TS,X,1)<>"0" THEN
TS=1:X=6
150 NEXT X
160 IF TS=1 THEN 70
170 HRS=VAL(LEFT$(TS,2)):MIN=VAL(MID$(TS,3,2))
180 SEC=VAL(RIGHT$(TS,2))
190 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR
SEC>59 THEN 70
200 CLS
210 TIM=HRS*3600+MIN*60+SEC
220 IF TIM>=43195! AND TIM<=43200! THEN 300
230 FOR D=1 TO 510:NEXT D
240 TIM=TIM+1:IF TIM>=46800! THEN TIM=3600
250 HRS=INT(TIM/3600):MIN=INT((TIM-HRS*3600)/60)
260 SEC=TIM-HRS*3600-MIN*60:TIMS="":00:00"
270 MID$(TIMS,2-(MIN<10))=MID$(STR$(MIN),2)
280 MID$(TIMS,5-(SEC<10))=MID$(STR$(SEC),2)
290 LOCATE 10,17:PRINT STR$(HRS);TIMS;" " :GOTO 220
300 FOR X=950 TO 100 STEP -10:SOUND X,1:NEXT X
310 FOR X=1 TO 50:BG=INT(RND*8):COLOR ,BG:CLS
320 SOUND 50,1:NEXT X:GOSUB 1000:COLOR CC:CLS
330 CH=CR(1-(FL*(INT(RND*4)+1)))
340 FOR BITMAP=1 TO 29:L=LT(BITMAP)
350 FOR Q=7 TO 0 STEP -1:IF L<BIN(Q) THEN 410
360 L=L-BIN(Q):IF FL THEN GOSUB 1000:COLOR CC
370 LOCATE 2*(7-Q)+5,BITMAP+5:PRINT CHR$(CH)
380 IF FL THEN GOSUB 1000:COLOR CC
390 LOCATE 2*(7-Q)+6,BITMAP+5:PRINT CHR$(CH)
400 SOUND 45,1:SOUND 100,0
410 NEXT Q:NEXT BITMAP
420 FOR X=1 TO 30:SOUND N(X),D(X):NEXT X
430 FL=NOT FL:GOTO 300
1000 P=INT(RND*14)+1:CC=BG+P+15*((BG+P)>15):RETURN
2000 DATA 0,0,129,255,1,0,0
2010 DATA 0,224,160,161,255,1,0,0
2020 DATA 0,239,145,145,239,0,0,0
2030 DATA 128,128,128,129,255,1
3000 DATA 196,8,262,12,247,4,262,8,330,8,294,12,277,4
3010 DATA 294,8,330,4,294,4,262,12,262,4,330,8,392,8
3020 DATA 440,24,440,8,392,12,330,4,330,8,262,8,294,12
3030 DATA 277,4,294,8,330,4,294,4,262,12,220,4,220,8
3040 DATA 196,8,262,24
4000 DATA 219,1,2,15,177
```

Tandy Color Computer/1987

```
10 DIM BIN(7):FL=0:BIN(0)=1
20 FOR X=1 TO 7:BIN(X)=BIN(X-1)*2:NEXT X
30 CLS:PRINT "TO SET THE COMPUTER CLOCK,"
40 PRINT "PLEASE INPUT THE TIME IN HOURS,"
50 PRINT "MINUTES, AND SECONDS"
```

```
60 PRINT "(E.G., 095502):"
70 PRINT "THEN PRESS <RETURN>." :PRINT
80 INPUT "WHAT TIME IS IT NOW";TS
90 IF LEN(TS)<>6 THEN 30
100 TS=0:FOR X=1 TO 6
110 IF VAL(MID$(TS,X,1))=0 AND MID$(TS,X,1)<>"0" THEN
TS=1:X=6
120 NEXT X
130 IF TS=1 THEN 30
140 HRS=VAL(LEFT$(TS,2)):MIN=VAL(MID$(TS,3,2))
150 SEC=VAL(RIGHT$(TS,2))
160 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR
SEC>59 THEN 30
170 TIM=HRS*3600+MIN*60+SEC:CLS
180 IF TIM>=43195 AND TIM<=43200 THEN 270
190 FOR DLY=1 TO 323:NEXT DLY:TIM=TIM+1
200 IF TIM>=46800 THEN TIM=3600
210 HRS=INT(TIM/3600):MIN=INT((TIM-HRS*3600)/60)
220 SEC=TIM-HRS*3600-MIN*60
230 PRINT@172,STR$(HRS);":";
240 PRINT CHR$(-(MIN<10)*48);RIGHT$(STR$(MIN),LEN(STR$(
MIN))-1);":";
250 PRINT CHR$(-(SEC<10)*48);RIGHT$(STR$(SEC),LEN(STR$(
SEC))-1);" "
260 GOTO 180
270 CLS
280 FOR X=255 TO 30 STEP -3:SOUND X,1:NEXT X
290 FOR X=1 TO 10:CLS(RND(9)-1)
300 SOUND RND(128),1:NEXT X
310 BG=RND(9)-1:CLS(BG):GOSUB 1000:CH=128+RND(15)
320 FOR BITMAP=1 TO 29:READ L
330 FOR Q=7 TO 0 STEP -1:IF L<BIN(Q) THEN 380
340 L=L-BIN(Q):IF FL THEN GOSUB 1000
350 PRINT@BITMAP+64*(7-Q),CHR$(CH+FG);
360 IF FL THEN GOSUB 1000
370 PRINT@BITMAP+64*(7-Q)+32,CHR$(CH+FG);:SOUND 1,1
380 NEXT Q:NEXT BITMAP
390 FOR X=1 TO 30:READ NT,DR:SOUND NT,DR*3:NEXT X
400 FL=NOT FL:RESTORE:GOTO 280
1000 P=RND(6)-(BG<2):FG=P+(P>=(BG-1))*(BG>1)
1010 FG=FG*16:RETURN
2000 DATA 0,0,129,255,1,0,0
2010 DATA 0,224,160,161,255,1,0,0
2020 DATA 0,239,145,145,239,0,0,0
2030 DATA 128,128,128,129,255,1
3000 DATA 89,2,133,3,125,1,133,2,159,2,147,3,140,1
3010 DATA 147,2,159,1,147,1,133,3,133,1,159,2,176,2
3020 DATA 185,6,185,2,176,3,159,1,159,2,133,2,147,3
3030 DATA 140,1,147,2,159,1,147,1,133,3,108,1,108,2
4000 DATA 89,2,133,6
```

Tandy Models III & 4 (Model III mode)/1987

```
10 DIM BIN(7):CLK=16919:FL=0:POKE 16420,1:BIN(0)=1
20 FOR X=1 TO 7:BIN(X)=BIN(X-1)*2:NEXT X
30 CLS:PRINT "PLEASE INPUT THE CURRENT TIME IN HOURS,
MINUTES, AND SECONDS"
40 PRINT "(E.G., 095502); THEN PRESS <ENTER>." :PRINT
50 INPUT "WHAT TIME IS IT NOW";TS
60 IF LEN(TS)<>6 THEN 30
70 TS=0:FOR X=1 TO 6
80 IF VAL(MID$(TS,X,1))=0 AND MID$(TS,X,1)<>"0" THEN T
S=1:X=6
90 NEXT X:IF TS=1 THEN 30
100 HRS=VAL(LEFT$(TS,2))
110 MIN=VAL(MID$(TS,3,2)):SEC=VAL(RIGHT$(TS,2))
120 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR
SEC>59 THEN 30
130 POKE CLK,SEC:POKE CLK+1,MIN:POKE CLK+2,HRS
140 CLS
150 IF RIGHT$(TIMES,8)="12:00:00" THEN 190
160 IF PEEK(CLK+2)=13 THEN POKE CLK+2,1
170 PRINT@345,RIGHT$(TIMES,8+(MID$(TIMES,10,1)="0"));C
HRS(32)
```


HOLIDAY PROGRAM

```

180 GOTO 150
190 CLS
200 CH=191-(RND(6)*FL):FOR BITMAP=1 TO 30:READ L
210 FOR Q=7 TO 0 STEP -1:IF L<BIN(Q) THEN 250
220 L=L-BIN(Q)
230 PRINT@BITMAP*2+128*(7-Q),CHR$(CH);CHR$(CH);
240 PRINT@BITMAP*2+128*(7-Q)+64,CHR$(CH);CHR$(CH);
250 NEXT Q:NEXT BITMAP
260 FOR X=1 TO 100:PRINT CHR$(23);CHR$(28);:NEXT X
270 FL=NOT FL:RESTORE:GOTO 200
1000 DATA 0,0,129,255,255,1,0,0
1010 DATA 0,224,160,161,255,1,0,0
1020 DATA 0,239,145,145,239,0,0,0
1030 DATA 128,128,128,129,255,1
    
```

TI-99/4A/1987

```

10 DIM BIN(7),LT(29),N(30),D(30),CB(5),CF(5)
20 RANDOMIZE
30 CALL CLEAR
40 FOR X=0 TO 7
50 BIN(X)=2^X
60 NEXT X
70 FOR X=1 TO 29
80 READ LT(X)
90 NEXT X
100 FOR X=1 TO 30
110 READ D(X),N(X)
120 NEXT X
130 READ CB(1),CB(2),CB(3),CB(4),CB(5)
140 READ CF(1),CF(2),CF(3),CF(4),CF(5)
150 FOR X=88 TO 127 STEP 8
160 CALL CHAR(X,"FFFFFFFFFFFFFFFF")
170 CALL CHAR(X+1,"AA55AA55AA55AA55")
180 CALL CHAR(X+2,"1824429999422418")
190 CALL COLOR(X/8-3,CF(X/8-10),1)
200 NEXT X
210 FL=0
    
```

```

220 CALL CLEAR
230 PRINT "TO SET THE COMPUTER CLOCK,"
240 PRINT "PLEASE INPUT THE TIME IN"
250 PRINT "HOURS, MINUTES, AND SECONDS"
260 PRINT "(E.G., 095502);"
270 PRINT "THEN PRESS <ENTER>."
280 PRINT
290 INPUT "WHAT TIME IS IT NOW?":TS
300 IF LEN(TS)<>6 THEN 220
310 TS=0
320 FOR X=1 TO 6
330 IF (ASC(SEG$(TS,X,1))>47)*(ASC(SEG$(TS,X,1))<58)TH
EN 360
340 TS=1
350 X=6
360 NEXT X
370 IF TS=1 THEN 220
380 HRS=VAL(SEG$(TS,1,2))
390 MN=VAL(SEG$(TS,3,2))
400 SEC=VAL(SEG$(TS,5,2))
410 IF (HRS<0)+(HRS>12)+(MN<0)+(MN>59)+(SEC<0)+(SEC>59
)THEN 220
420 CALL CLEAR
430 TIM=HRS*3600+MN*60+SEC
440 IF (TIM>=43195)*(TIM<=43200)THEN 610
450 FOR DL=1 TO 60
460 NEXT DL
470 TIM=TIM+1
480 IF TIM<46800 THEN 500
490 TIM=3600
500 IF TIM/2<>INT(TIM/2)THEN 440
510 HRS=INT(TIM/3600)
520 MN=INT((TIM-HRS*3600)/60)
530 SEC=TIM-HRS*3600-MN*60
540 MS="0"&STR$(MN)
550 SS="0"&STR$(SEC)
560 TS=STR$(HRS)&" ":"&SEG$(MS,LEN(MS)-1,2)&" ":"&SEG$(SS,
    
```

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```

LEN(S$)-1,2)8" "
570 FOR X=1 TO LEN(T$)
580 CALL HCHAR(10,12,X,ASC(SEG$(T$,X,1)))
590 NEXT X
600 GOTO 440
610 CALL CLEAR
620 FOR X=1000 TO 200 STEP -18
630 CALL SOUND(100,X,0)
640 NEXT X
650 FOR X=1 TO 20
660 CALL SCREEN(CB(INT(RND*5)+1))
670 CALL SOUND(50,-5,0)
680 NEXT X
690 CALL SCREEN(1)
700 CH=FL*(INT(RND*2)+1)
710 CS=INT(RND*5)
720 FOR BITMAP=1 TO 29
730 L=LT(BITMAP)
740 FOR Q=7 TO 0 STEP -1
750 IF L<BIN(Q) THEN 810
760 L=L-BIN(Q)
770 CALL SOUND(20,-5,0)
780 IF FL=0 THEN 800
790 CS=INT(RND*5)
800 CALL VCHAR(2*(7-Q)+4,BITMAP,88+CH+CS*8,2)
810 NEXT Q
820 NEXT BITMAP
830 FOR X=1 TO 30
840 CALL SCREEN(CB(INT(RND*5)+1))
850 CALL SOUND(D(X),N(X),0)
860 NEXT X
870 FL=1-FL
880 GOTO 620
1000 DATA 0,0,129,255,1,0,0
1010 DATA 0,224,160,161,255,1,0,0
1020 DATA 0,239,145,145,239,0,0,0
1030 DATA 128,128,128,129,255,1

```

```

2000 DATA 250,262,375,349,125,330,250,349,250,440
2010 DATA 375,392,125,370,250,392,125,440,125,392
2020 DATA 375,349,125,349,250,440,250,523,750,587
2030 DATA 250,587,375,523,125,440,250,440,250,349
2040 DATA 375,392,125,370,250,392,125,440,125,392
2050 DATA 375,349,125,294,250,294,250,262,750,349
3000 DATA 2,5,7,13,15,4,6,10,12,16

```

VIC-20/1987

```

10 DIM BIN(7),LT(20),N(30),D(30),CR(5)
20 FOR X=0 TO 7:BIN(X)=2^X:NEXT X
30 FOR X=1 TO 20:READ LT(X):NEXT X
40 FOR X=1 TO 30:READ N(X),D(X):NEXT X
50 READ CR(1),CR(2),CR(3),CR(4),CR(5)
60 FL=0:BG=INT(RND(0)*8):POKE 36878,15
70 PRINT CHR$(147);"TO SET THE COMPUTER":
80 PRINT "CLOCK, PLEASE INPUT"
90 PRINT "MINUTES, AND SECONDS"
100 PRINT "THE TIME IN HOURS,"
110 PRINT "(E.G., 095502);"
120 PRINT "THEN PRESS <RETURN>." :PRINT
130 PRINT "WHAT TIME IS IT NOW?":INPUT TS
140 IF LEN(TS)<6 THEN 70
150 TS=0:FOR X=1 TO 6
160 IF VAL(MID$(TS,X,1))=0 AND MID$(TS,X,1)<>"0" THEN
TS=1:X=6
170 NEXT X
180 IF TS=1 THEN 70
190 HRS=VAL(LEFT$(TS,2)):MIN=VAL(MID$(TS,3,2))
200 SEC=VAL(RIGHT$(TS,2))
210 IF HRS<1 OR HRS>12 OR MIN<0 OR MIN>59 OR SEC<0 OR
SEC>59 THEN 70
220 TIS=TS:PRINT CHR$(147);
230 IF VAL(TIS)>=115955 AND VAL(TIS)<=120000 THEN 290
240 IF TIS="130000" THEN TIS="010000"
250 ZR=-(LEFT$(TIS,1)="0")
260 PRINT CHR$(19);TAB(7);MID$(TIS,ZR+1,2-ZR);":":

```

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TIPS TO THE TYPIST

Typing BASIC programs from FAMILY COMPUTING is a great way to learn about programming and get some free software to boot! But it's frustrating to type in a long program, only to find it doesn't work as it should. If you're new to typing in programs, here are some tips to help make your first experiences rewarding ones.

BEFORE TYPING IN A PROGRAM

1. Check to see if it will run on your computer under a version of BASIC you have available. Also check to see if special hardware—a disk drive, joysticks, or a printer, for example—is required. Unless the program heading indicates otherwise, you can assume that a program will run under any standard version of BASIC on any standard hardware configuration of your machine, with these exceptions:

- "Apple II series" programs will run under Applesoft BASIC on the Apple II plus (w/language card), IIe, and IIc. Programs requiring a disk drive will work equally well under DOS 3.3 or ProDOS.

- Compatibility of IBM BASIC Programs is determined by both the hardware and the version of BASIC used. Our "IBM PC & compatibles" programs are composed on IBM PCs & PCjr's and tested under most versions of BASIC available for those machines. They are then tested on a variety of IBM-compatible machines under the versions of BASIC supplied with them. Each IBM PC & compatibles program listing is supplemented by a rundown of the machines and versions of BASIC under which the program is guaranteed to work. Most programs will probably run on many other PC compatibles and under other versions of BASIC.

- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

2. If you have a disk drive, prepare ("format" or "initialize") a disk so you can save the program once you're finished typing. Your DOS (Disk Operating System) manual or disk-drive manual will tell you how.

3. Get your version of BASIC fired up and ready. Read the introductory chapters of your BASIC manual for instructions.

WHILE TYPING, KEEP IN MIND THAT . . .

1. BASIC programs consist of "lines," each beginning with a line number (Macintosh BASIC "lines" don't need line numbers), containing letters, numbers, and punctuation marks of various kinds. Each "line" may be composed of several "statements"—instructions that tell the computer to perform various actions—and may continue over several physical lines on the page and/or on your screen.

When typing in a BASIC program, forget considerations of format and get the *content* of what you type to match the *content* of what you see on the printed page. Regardless of how margins may break up a program "line," it hasn't ended until you reach another line number or the end of the program listing. Begin typing with the line number, then continue on, typing every letter, number, space, and punctuation mark in the order it appears, ignoring margins. Where the "line" ends, there will usually be some trailing spaces (which you don't have to type in), followed by the next line number at the left margin of the listing. At this point, all you have to do is press the RETURN or ENTER key to register the "line" in memory, then continue with the next "line."

2. All marks in a program listing—including every letter, number, space, and punctuation mark—*mean* something to your computer. Moreover, even symbols that look very similar to you mean completely different things to the machine. For example, it is important to distinguish between "1" (number one) and "l" (small letter "L"), or "O" (capital letter "O") and "0" (digit zero). Note that zeros are slashed in most program listings to facilitate discrimination.

It's important, therefore, to duplicate every line exactly when typing. Otherwise you can't expect the program to work as it should, or even work at all. Even uppercase versus lowercase is important on certain computers; the words "PRINT" and "print" may mean completely different things.

3. Each computer has its own commands and keys for program "editing," and your user's manual will tell you how to use them. Besides the editing keys, there are two sure-fire ways of correcting errors in a BASIC program line. If you're just typing along and make a mistake, press the backspace-delete key (the back-arrow key on most systems) to rub out the offending character, and then continue typing. Once you've pressed RETURN or ENTER to register the line, mistakes are a little harder to fix. You must use the editing keys or type the line in again from the beginning (including the line number) and press RETURN or ENTER. The new line will replace the old one with the same line number in your computer's memory. This option is a little more work, but foolproof.

AFTER YOU'VE FINISHED . . .

1. Just type RUN and press RETURN or ENTER. If you've typed everything correctly, the program should work as described.

2. Of course, it almost never does, not even for seasoned programmers. Typing in a program and having it run off the bat qualifies as a small miracle. Usually there are one or more mistakes, major or minor, that have slipped past your careful scrutiny and are causing your computer to do unexpected things. Not to worry. Now comes what some people consider the most enjoyable part of the programming process: a procedure called "debugging"—finding and eliminating your mistakes. To review portions of your program on the computer screen, use the LIST command as explained in your BASIC manual. If you have a printer, you might find it more convenient to print out what you've typed (check your manual for the appropriate command). Look over each section of the program carefully, preferably with someone else's help. Make sure you haven't dropped a line or a character, miscounted spaces between a pair of quotes, mistaken a comma for a period, mixed up an "O" and a zero, or (most likely) all of the above. When you find a mistake, retype the offending line from the original listing, including the line number, and press RETURN or ENTER as explained above.

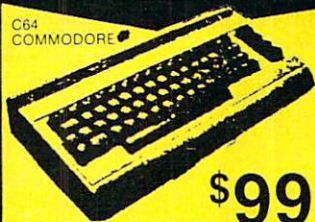
Naturally, mistakes tend to occur more frequently in certain areas of a program than in others. Complicated equations are easy to foul up by dropping or mismatching parentheses or math symbols. Data statements—program lines beginning with the usual number, followed by the word DATA—are another popular trouble spot. Check them carefully. And, of course, remember to SAVE a copy of the corrected program when you're finished.

Good luck!

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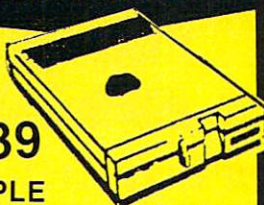
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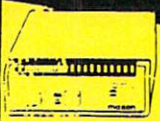
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"New Products is a monthly feature consisting of paid announcements. More information about the products can be obtained by circling the corresponding reader service number. For rate information or call 212-505-3587. Publisher reserves the right to edit or reject all announcements."

The Home Money Manager

A PC/MS-DOS version of the Home Money Manager (HMM) is now available from Homecraft Computer Products for \$59.95. The CPM version of this software has been available since early 1985 and the reviewers have been calling it the easiest to use, full-featured home financial manager available.

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arate registers. Plus, HMM has two editors allowing you to change entries as you are making them, or at any time after you've completed the entry. Other features include search functions (by check number, budget category, payee name or date), a full complement of printed reports, plus HMM can store a complete year's worth of financial data on a single disk.

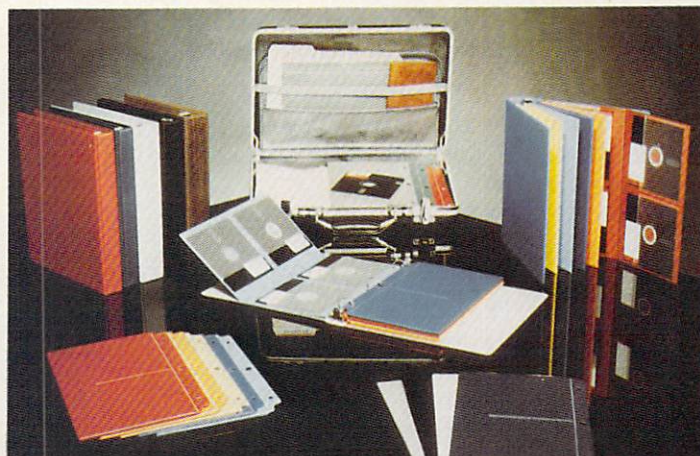
HMM is not copy protected, HELP screens are available at every prompt, and it comes with an easy to read manual. Plus, HMM is the only software with telephone support available on weekends! Call (503) 692-3732 for more info.

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This Month!!

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MICROTONES, page 89
COMPUCOPIA, page 91

**Shake 'Em Up
With Computer Shake
Page 89**

Edited by Bernadette Grey

POK POWER

FOR THE COMPUTER GENERATION

Dan Buntен Meets the Special Ks

**Creator of *M.U.L.E.*
and
Seven Cities of Gold
Shows Off
His Latest Game**

It was a day like any other day. We had just solved an adventure game and were looking for another challenge. Suddenly, a strange silence descended upon the K-POWER office, and in walked a tall stranger, clutching a mysterious package. We soon learned that the tall stranger was **Dan Buntен**, designer of such games as *M.U.L.E.*, *Seven Cities of Gold*, and *Heart of Africa*. The mysterious package in Dan's grasp contained his latest creation: *Robot Rascals*.

We introduced ourselves to Dan, exchanged a few firm handshakes, and started to look the game over. We were struck by the fact that *Robot Rascals* came with a bunch of curious-looking cards. Two bunches, in fact. Gazing suspiciously at Dan, we secretly wondered if he was trying to get us to play some kind of bizarre, space-age version of "Go Fish." Fortunately, we discovered our first impression was completely wrong.

The rules were easy: Each player had to find a certain number of items hidden around the world and make it back to a home base. It was like a scavenger hunt. What could be simpler? But it was then that we suddenly found ourselves in an uncooperative environment: Treads breaking down in the rocks, motors fizzling out in the forests, te-



Rascally Dan Buntен at play

leports not working, and lakes drying up. The worst part was running out of energy, just inches away from home, and having another player snatch away all our hard-earned goodies. Well, this was certainly a long way from "Go Fish!"

Dan said he had wanted to create a game similar to *M.U.L.E.*, but for a much broader audience. So when he sat down at his computer in December 1985, Dan tried to eliminate a lot of the numbers and calculations that players have to make playing games like *M.U.L.E.* and to even out the amount of luck and skill involved. What he wound up with was a multiplayer scavenger hunt that can be as friendly or as cutthroat as its players are.

As we played, we asked Dan how he got his start as a game designer. He told us he started making games for his own enjoyment and then began creating them for Strategic Simulations, Inc., a software publishing house. From there, he went on to create several classic hit games. He told us that he even has plans for a new game, but he didn't give away too many details. Anyway, we wish him luck on his next game.

Oh! Did we forget to mention how our first game turned out? Well, needless to say, we were all so busy listening to the history of the game and doing nasty things to each other that shrewd Mr. Buntен walked away with an easy victory. —JEFF DONAHUE, GREG SHAKAR, SASHA PETRASKI

STRATEGY

TIPS, TRICKS, AND HINTS

ROGUE

Epyx, Inc. Arcade/Skill. Your mission: Explore the never-ending levels of the Dungeons of Doom and recover the lost amulet of Yendor—and get back to the surface in one piece. Along the way, you'll discover hordes of monsters, ranging from trolls to copying machines. To help you on your quest, you must use your weapons, your wits, and the multitude of items that can be found within the dungeon. (The hints and game are for Amiga, Atari ST, and Macintosh.)

Food and magic are your most valuable possessions. Use them sparingly. Both get increasingly scarce as you descend further into the dungeon. Wait until your characters are faint with hunger before eating, and save wands and staves for the really tough monsters, such as Griffins and Jabberwocks. Scrolls are the exception to the rule. Since they are most often helpful, read at the first opportunity.

Wands and staves that shoot magic may ricochet. Make sure you are facing your opponent on a diagonal line before you zap it.



One of the many monsters you'll encounter is a Hobgoblin.

Wands of polymorphing are dangerous on low levels, since you run the risk of turning a monster into something even more powerful. Use them when you are very deep in the dungeon because odds are that you will turn a very nasty monster into one that is less formidable.

Aquators, which rust through your character's armor, like to lurk

in dark rooms and behind doors. If you see one coming, remove your armor or try to fight it from a distance.

Let sleeping monsters lie until you have cleared the rest of the level.

Some scrolls and potions identify themselves as soon as they are used. For those that don't, refer to the following charts:

Message

Weapon gives off a flash of white light.
Weapon glows blue.
Armor glows faintly.
Hands glow red.
Hear a high-pitched humming noise.
Feel as if someone is watching you.
This scroll has a map on it.
This scroll is an identify scroll.
Hear a cry of anguish in distance.
Hear laughter in distance.
You fall asleep.
Scroll vanishes as you're reading it.
Scroll vanishes as you're reading it.
Nose tingles as you sense food.
Nothing on paper to read.

Message

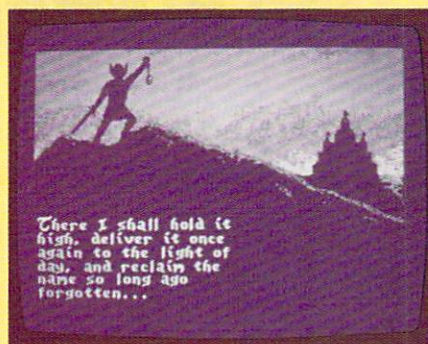
You're confused.
You can't move.
This potion tastes like slime mold juice.
You suddenly feel more skillful.
You sense the presence of magic.
No message displayed.
This potion has an extremely dull taste.
A cloak of darkness falls around you.
You feel yourself moving much faster.
You feel sick.
You feel better.
You feel much better.
You feel stronger.
You feel warm all over.

Name of scroll

Vorpalize weapon
Enchant weapon
Enchant armor
Monster confusion
Aggravate monster
Remove curse
Magic mapping
Identify
Hold monster
Scare monster
Sleep
Teleportation
Create monster
Food detection
Blank paper

Name of potion

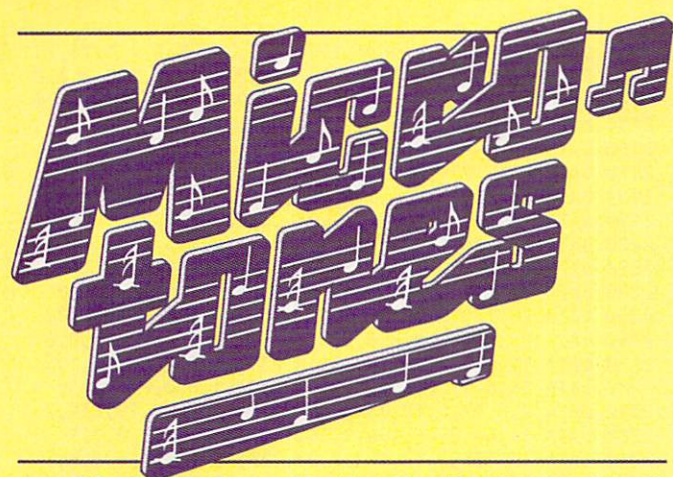
Confusion
Paralysis
See invisible
Raise level
Magic detection
Monster detection
Quench thirst
Blindness
Haste self
Poison
Healing
Extra healing
Gain strength
Restore strength



If you search carefully for magic items (top), you'll have a better shot at victory (bottom).

The most frequent complaint about the game is the player's high mortality rate. We found the following method very helpful in keeping our characters alive: As soon as you have completed a level, save your game. When the disk is through accessing, remove it from the disk drive and slide the write-protect button to the up position. Next, restore your game and proceed to the next level. If you are killed during this foray, the machine will attempt to erase your character from the disk, but it will be prevented from doing so by the write-protect function. Therefore, it is a simple matter of restoring your position, and you'll never be more than one level away from where your character was terminated.

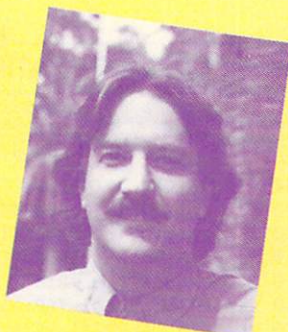
If you have one identify scroll and several magic items, you can try saving your position as described above, and then identifying an item, restoring the game, and identifying another item. You can do this indefinitely.—JEFF DONAHUE, 18, Bronx, New York; STEPHEN KING, Riverside, California



MUSIC PROGRAMS BY JOEY LATIMER

COMPUTER SHAKE

The label on the disk said, "Run at your own risk!" I picked up the disk, looked nervously around the computer store, and slid it in the demo computer's disk drive. Though anxious about the warning, the temptation was too great. I loaded the only file on the disk, the *Computer Shake*, and typed RUN. To my amazement, the computer began to play a lively beat and shake wildly to the music!



When the computer salesman heard the tune, he ran across the store yelping some unintelligible exclamation. He was too late. The shake-up had already started, and the BREAK key didn't seem to work. I stood, dumbfounded, as all of the computers in the store began to vibrate slightly and then shake violently. Giggling at the sight, I watched an IBM PCjr bounce by, dragging a laser printer out the door.

If you'd like to learn how the infamous *Shake* came to be, just type the program into your computer, SAVE it, and then RUN it (at your own risk, of course)!



ATARI 400/800, 600/800XL, & 130XE/ COMPUTER SHAKE

```
10 DIM BLS$(33),CLS$(33),TS$(33),TTS$(33)
20 DIM V1(132,2),V2(421,2),V3(401,2)
30 DIM WS$(720),WD$(20),XX$(36):OPEN #1,4,0,"K:"
40 BLS$=CHR$(32):BLS$(33)=BLS$:BLS$(2)=BLS$
50 TTS$=" ((( THE COMPUTER SHAKE )))"
60 CLS$=CHR$(125):CLS$(2,3)=CHR$(29)
70 CLS$(LEN(CLS$)+1)=TTS$:CLS$(LEN(CLS$)+1)=CHR$(29)
80 POKE 752,1:POKE 82,4:POKE 83,37
```

```
90 POKE 710,159:POKE 709,3:POKE 712,44:PRINT CLS$
100 POSITION 13,4:PRINT "TUNING UP ...";
110 FOR X=1 TO 20:READ WD:WD(X)=WD:READ TS
120 TL=LEN(TS):IF TS(TL,TL)="/" THEN TS(TL,TL)=", "
130 IF TL<33 THEN TS(TL+1)=BLS$
140 WS$(X*33-32)=TS:NEXT X:WS$(103,103)=", "
150 FOR X=1 TO 132:READ N,D
160 V1(X,1)=N:V1(X,2)=D:NEXT X
170 FOR X=1 TO 21:READ N,D
180 V2(X,1)=N:V2(X,2)=D:NEXT X
190 N=22:FOR J=1 TO 19:FOR X=1 TO 21
200 V2(N,1)=V2(X,1):V2(N,2)=V2(X,2)
210 N=N+1:NEXT X:NEXT J
220 READ N,D:V2(400,1)=N:V2(400,2)=D
230 FOR X=1 TO 20:READ N,D
240 V3(X,1)=N:V3(X,2)=D:NEXT X
250 N=21:FOR J=1 TO 19:FOR X=1 TO 20
260 V3(N,1)=V3(X,1):V3(N,2)=V3(X,2)
270 N=N+1:NEXT X:NEXT J
280 READ N,D:V3(381,1)=N:V3(381,2)=D
290 FOR X=1 TO 2:V2(421,X)=0:NEXT X
300 FOR X=1 TO 2:V3(401,X)=0:NEXT X
310 PRINT CLS$:X=1:P1=1:P2=1:P3=1:T1=0:T2=0:T3=0
320 IF P1=WD(X) THEN PRINT WS$(X*33-32,X*33):X=X+1:GOTO 340
330 FOR DE=1 TO 12:NEXT DE
340 SOUND 1,V1(P1,1),10,10:SOUND 2,V2(P2,1),10,8
350 SOUND 3,V3(P3,1),10,4:T1=T1+1:T2=T2+1:T3=T3+1
360 IF T1=V1(P1,2) THEN T1=0:P1=P1+1:SOUND 1,0,0,0
370 IF T2=V2(P2,2) THEN T2=0:P2=P2+1:SOUND 2,0,0,0
380 IF T3=V3(P3,2) THEN T3=0:P3=P3+1:SOUND 3,0,0,0
390 IF P1<133 THEN 320
400 GET #1,K:GOTO 310
1000 DATA 2,DOWN IN JAMAICA
1010 DATA 7,THERE WAS A GUY NAMED "VIC".
1020 DATA 15,HE LIKED TO PROGRAM COMPUTERS --
1030 DATA 23,MAN+ HE KNEW EVERY TRICK.
1040 DATA 31,ONE DAY AS HE WAS WORKING
1050 DATA 38,OUT IN HIS SHOP+
1060 DATA 44,HE CAME UP WITH A PROGRAM THAT
1070 DATA 52,MADE HIS COMPUTER HOP.
1080 DATA 60,THEN IT JUMPED DOWN ON THE FLOOR+
1090 DATA 68,SHIMMIED OUT THE DOOR+
1100 DATA 74,AND AS IT BOOGIED DOWN THE STREET+
1110 DATA 83,ALL THE COMPUTERS IT WOULD MEET
1120 DATA 92,BEGAN TO SHAKE ...
1130 DATA 97,DO THE COMPUTER SHAKE.
1140 DATA 104,NO ONE COULD FIND THE <BREAK>
1150 DATA 111,FOR THE COMPUTER SHAKE.
1160 DATA 118,NO ONE COULD FIND THE <BREAK>
1170 DATA 125,TO STOP,128,THE COMPUTER SHAKE.,999,0
1180 DATA 0,64,81,4,91,2,102,2,91,4,81,4,0,2,121
1190 DATA 2,102,2,91,2,81,4,91,4,81,2,0,24,121,2
1200 DATA 102,2,91,2,81,4,91,2,102,2,91,4,81,4,0
1210 DATA 2,121,2,102,2,91,2,81,4,76,4,81,2,0,28
1220 DATA 91,2,81,2,81,2,91,2,102,2,81,4,91,4,0
1230 DATA 4,121,4,102,4,91,4,81,2,0,28,91,2,81,2
1240 DATA 81,2,91,2,102,2,81,4,91,2,102,2,0,2,121
1250 DATA 2,102,2,91,2,81,4,91,4,121,2,0,26,102,2
1260 DATA 91,2,81,2,81,2,91,2,102,2,81,8,0,16,81
1270 DATA 2,81,2,91,2,102,2,121,8,0,10,121,2
1280 DATA 102,2,91,2,81,2,81,2,91,2,102,2,81,8
1290 DATA 0,10,121,2,102,2,91,2,81,2,81,2,91,2
1300 DATA 102,2,81,8,0,6,121,2,102,4,91,4,121,2
1310 DATA 0,16,102,2,102,2,121,2,102,4,91,4,81,2
1320 DATA 0,16,121,2,102,2,121,2,102,4,91,4,81,2
1330 DATA 0,16,102,2,102,2,121,2,102,4,91,4,121
1340 DATA 2,0,16,121,2,102,2,121,2,102,4,91,4
1350 DATA 81,2,0,8,91,2,102,2,0,6,102,2,121,2
1360 DATA 102,4,91,4,121,16,243,2,102,1,102
1370 DATA 1,0,2,102,2,243,2,102,1,102,1,0,2
1380 DATA 102,2,182,2,76,1,76,1,182,1,0,1,76
1390 DATA 2,162,2,68,1,68,1,0,2,68,2,102,16,0
1400 DATA 2,81,1,81,1,0,2,81,2,0,2,81,1,81,1
1410 DATA 0,2,81,2,0,2,60,1,60,1,0,2,60,2,0,2
1420 DATA 53,1,53,1,0,2,53,2,81,16
```




COMMODORE 64 & 128 (C 64 MODE)/ COMPUTER SHAKE

```

10 DIM V1(132,3),V2(421,3),V3(401,3)
20 DIM WD(20),WS(20):S=54272
30 TTS="      ((( THE COMPUTER SHAKE )))"
40 CLS=CHR$(147)+CHR$(13)+CHR$(13)+TTS+CHR$(13)
50 POKE 53280,3:POKE 53281,1:PRINT CHR$(144):CLS
60 PRINT TAB(14);"TUNING UP ..."
70 FOR X=0 TO 23:POKE S+X,0:NEXT X
80 POKE S+5,28:POKE S+6,192:POKE S+12,28
90 POKE S+13,192:POKE S+19,28:POKE S+20,192
100 POKE S+24,15:X1=S+4:X2=S+11:X3=S+18
110 FOR X=1 TO 20:READ WD(X),WS(X):NEXT X
120 FOR X=1 TO 132:READ V1(X,1),V1(X,2),V1(X,3):NEXT X
130 FOR X=1 TO 21:READ V2(X,1),V2(X,2),V2(X,3):NEXT X
140 N=22:FOR J=1 TO 19:FOR X=1 TO 21
150 V2(N,1)=V2(X,1):V2(N,2)=V2(X,2):V2(N,3)=V2(X,3)
160 N=N+1:NEXT X:NEXT J
170 N=400:READ V2(N,1),V2(N,2),V2(N,3)
180 FOR X=1 TO 20:READ V3(X,1),V3(X,2),V3(X,3):NEXT X
190 N=21:FOR J=1 TO 19:FOR X=1 TO 20
200 V3(N,1)=V3(X,1):V3(N,2)=V3(X,2):V3(N,3)=V3(X,3)
210 N=N+1:NEXT X:NEXT J
220 N=381:READ V3(N,1),V3(N,2),V3(N,3)
230 FOR X=1 TO 3:V2(421,X)=0:NEXT X
240 FOR X=1 TO 3:V3(401,X)=0:NEXT X
250 IF P1=WD(X) THEN PRINT TAB(4);WS(X):X=X+1
260 PRINT CLS:X=1:P1=1:P2=1:P3=1:T1=0:T2=0:T3=0
270 IF P1=WD(X) THEN PRINT TAB(4);WS(X):X=X+1
280 POKE S+1,V1(P1,1):POKE S,V1(P1,2)
290 POKE S+8,V2(P2,1):POKE S+7,V2(P2,2)
300 POKE S+15,V3(P3,1):POKE S+14,V3(P3,2)
310 POKE X1,33:POKE X2,33:POKE X3,33
320 T1=T1+1:T2=T2+1:T3=T3+1
330 IF T1=V1(P1,3) THEN T1=0:P1=P1+1:POKE X1,32
340 IF T2=V2(P2,3) THEN T2=0:P2=P2+1:POKE X2,32
350 IF T3=V3(P3,3) THEN T3=0:P3=P3+1:POKE X3,32
360 IF P1<>133 THEN 270
370 GET K$:IF K$="" THEN 370
380 GOTO 260
1000 DATA 2,DOWN IN JAMAICA
1010 DATA 7,"THERE WAS A GUY NAMED VIC."
1020 DATA 15,HE LIKED TO PROGRAM COMPUTERS --
1030 DATA 23,"MAN, HE KNEW EVERY TRICK."
1040 DATA 31,ONE DAY AS HE WAS WORKING
1050 DATA 38,"OUT IN HIS SHOP,"
1060 DATA 44,HE CAME UP WITH A PROGRAM THAT
1070 DATA 52,"MADE HIS COMPUTER HOP."
1080 DATA 60,"THEN IT JUMPED DOWN ON THE FLOOR,"
1090 DATA 68,"SHIMMIED OUT THE DOOR,"
1100 DATA 74,"AND AS IT BOOGIED DOWN THE STREET,"
1110 DATA 83,ALL THE COMPUTERS IT WOULD MEET
1120 DATA 92,"BEGAN TO SHAKE ..."
1130 DATA 97,"DO THE COMPUTER SHAKE."
1140 DATA 104,"NO ONE COULD FIND THE <BREAK>"
1150 DATA 111,"FOR THE COMPUTER SHAKE."
1160 DATA 118,NO ONE COULD FIND THE <BREAK>
1170 DATA 125,TO STOP
1180 DATA 128,"THE COMPUTER SHAKE.",0,0
2000 DATA 0,0,64,25,30,4,22,96,2,19,239,2,22,96,4,25
2010 DATA 30,4,0,0,2,16,195,2,19,239,2,22,96,2,25,30
2020 DATA 4,22,96,4,25,30,2,0,0,24,16,195,2,19,239,2
2030 DATA 22,96,2,25,30,4,22,96,2,19,239,2,22,96,4
2040 DATA 25,30,4,0,0,2,16,195,2,19,239,2,22,96,2
2050 DATA 25,30,4,26,156,4,25,30,2,0,0,28,22,96,2
2060 DATA 25,30,2,25,30,2,22,96,2,19,239,2,25,30,4
2070 DATA 22,96,4,0,0,4,16,195,4,19,239,4,22,96,4
2080 DATA 25,30,2,0,0,28,22,96,2,25,30,2,25,30,2,22
2090 DATA 96,2,19,239,2,25,30,4,22,96,2,19,239,2,0,0
2100 DATA 2,16,195,2,19,239,2,22,96,2,25,30,4,22,96
2110 DATA 4,16,195,2,0,0,26,19,239,2,22,96,2,25,30,2

```

```

2120 DATA 25,30,2,22,96,2,19,239,2,25,30,8,0,0,16,25
2130 DATA 30,2,25,30,2,22,96,2,19,239,2,16,195,8,0,0
2140 DATA 10,16,195,2,19,239,2,22,96,2,25,30,2,25,30
2150 DATA 2,22,96,2,19,239,2,25,30,8,0,0,10,16,195
2160 DATA 2,19,239,2,22,96,2,25,30,2,25,30,2,22,96
2170 DATA 2,19,239,2,25,30,8,0,0,6,16,195,2,19,239
2180 DATA 4,22,96,4,16,195,2,0,0,16,19,239,2,19
2190 DATA 239,2,16,195,2,19,239,4,22,96,4,25,30,2
2200 DATA 0,0,16,16,195,2,19,239,2,16,195,2,19,239
2210 DATA 4,22,96,4,25,30,2,0,0,16,19,239,2,19,239
2220 DATA 2,16,195,2,19,239,4,22,96,4,16,195,2,0,0
2230 DATA 16,16,195,2,19,239,2,16,195,2,19,239,4,22
2240 DATA 96,4,25,30,2,0,0,8,22,96,2,19,239,2,0,0,6
2250 DATA 19,239,2,16,195,2,19,239,4,22,96,4,16,195
2260 DATA 16,8,97,2,19,239,1,19,239,1,0,0,2,19,239
2270 DATA 2,8,97,2,19,239,1,19,239,1,0,0,2,19,239,2
2280 DATA 11,48,2,26,156,1,26,156,1,11,48,1,0,0,1
2290 DATA 26,156,2,12,143,2,29,223,1,29,223,1,0,0,2
2300 DATA 29,223,2,19,239,16,0,0,2,25,30,1,25,30,1
2310 DATA 0,0,2,25,30,2,0,0,2,25,30,1,25,30,1,0,0
2320 DATA 2,25,30,2,0,0,2,33,135,1,33,135,1,0,0,2
2330 DATA 33,134,2,0,0,2,37,162,1,37,162,1,0,0,2
2340 DATA 37,162,2,25,30,16

```



IBM PCjr & COMPATIBLES/COMPUTER SHAKE

This program has been tested and found to work on the following computers and hardware configurations, using the BASICS shown: IBM PCjr w/Cartridge BASIC J1.00 and TV or monitor w/speaker. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00 and TV or monitor w/speaker.

```

10 DIM M$(18),WS(19)
20 FOR X=1 TO 19:READ WS(X):NEXT X
30 FOR X=1 TO 18:READ M$(X):NEXT X
40 READ CS,DS:AS=CS+DS:READ CS,DS:BS=CS+DS
50 SOUND ON:WIDTH 40:KEY OFF:COLOR 0,3:LOCATE ,0
60 CLS:PRINT:PRINT TAB(8);"((( THE COMPUTER SHAKE )))"
70 PLAY AS,BS:PRINT:PRINT
80 FOR X=1 TO 18:PLAY AS,BS,M$(X)
90 FOR DE=1 TO 1000-(X MOD 2)*(X<10)*600:NEXT DE
100 PRINT TAB(3);WS(X):NEXT X
110 PLAY "O3T95C1","O3T95E-1","O3T95G1"
120 K$=INKEY$:IF K$="" THEN 120 ELSE 60
1000 DATA DOWN IN JAMAICA
1010 DATA "THERE WAS A GUY NAMED VIC."
1020 DATA HE LIKED TO PROGRAM COMPUTERS --
1030 DATA "MAN, HE KNEW EVERY TRICK."
1040 DATA ONE DAY AS HE WAS WORKING
1050 DATA "OUT IN HIS SHOP,"
1060 DATA HE CAME UP WITH A PROGRAM THAT
1070 DATA "MADE HIS COMPUTER HOP."
1080 DATA "THEN IT JUMPED DOWN ON THE FLOOR,"
1090 DATA "SHIMMIED OUT THE DOOR,"
1100 DATA "AND AS IT BOOGIED DOWN THE STREET,"
1110 DATA ALL THE COMPUTERS IT WOULD MEET
1120 DATA "BEGAN TO SHAKE ..."
1130 DATA "DO THE COMPUTER SHAKE."
1140 DATA "NO ONE COULD FIND THE <BREAK>"
1150 DATA "FOR THE COMPUTER SHAKE."
1160 DATA "NO ONE COULD FIND THE <BREAK> TO STOP"
1170 DATA "THE COMPUTER SHAKE.",0
2000 DATA MBT190V12L403P1P1P1
2010 DATA G2FE-F2G2P4CE-F62F2
2020 DATA GP1P1P1CE-F,G2FE-F2G2P4CE-FG2A-2
2030 DATA GP1P1P1P2F8,GGFE-G2F2P2C2E-2F2
2040 DATA GP1P1P1P2F,GGFE-G2FE-P4CE-FG2F2
2050 DATA CP1P1P1P4E-F,GGFE-G1P1P1,GGFE-C1P1P4CE-F
2060 DATA GGFE-G1P1P4CE-F,GGFE-G1P2P4CE-2F2
2070 DATA CP1P1E-E-CE-2F2,GP1P1CE-CE-2F2
2080 DATA GP1P1E-E-CE-2F2,CP1P1CE-CE-2F2
2090 DATA GP1FE-P2P4E-CE-2F2
3000 DATA MBT190V10L402C>E-8E-8P4E-<C>E-8E-8P4E-
3010 DATA <F>A-8A-8<F8P8>A-<G>B-8B-8P4B-
4000 DATA MBT190V10L803P4GGP4G4P4GGP4G4
4010 DATA P4>CCP4C4P4DDP4D4

```


COMPU COPIA

SHORT PROGRAMS BY STEVEN C. M. CHEN

BLOWING BUBBLES

Bubble gum bubbles can be pretty gunky things. Even though it's fun to see who can blow the biggest bubble, unless you're careful, the gooey pink stuff can end up all over your face, in your hair, and on your clothes. With our *Blowing Bubbles* program, you and a buddy can have a bubble-blowing contest without the sticky side effects.

You each choose a side ("P" key or "Q" key), and take turns blowing up the bubble. Each press of the key increases the bubble size, and there is no limit to the number of "blows" you can make per turn. The object is to blow the biggest bubble, but if you press the key that bursts the bubble, you're as good as gummy!

—KAREN KANE

ADAM/BLOWING BUBBLES

```
10 DIM ca(22),sa(22):HOME:HGR
20 FOR a = 0 TO 22:sa(a) = SIN(a*.2856)
30 ca(a) = -COS(a*.2856):NEXT a:VTAB 21:HTAB 1
40 PRINT "Press <Q>";SPC(11);"Press <P>."
50 r = 15+INT(RND(1)*6):rf = r+10+INT(RND(1)*31)
60 HCOLOR= 7:GOSUB 1000
70 GET k$:k = ASC(k$):IF k = 3 THEN 190
80 k$ = CHR$(k-32*(k > 96)*(k < 123))
90 IF k$ <> "Q" AND k$ <> "P" THEN 70
100 HCOLOR= 0:GOSUB 1000
110 r = r+2:IF r < rf THEN 60
120 FOR d = 1 TO 50:NEXT d
130 r = r+15:HCOLOR= 1:GOSUB 1000
140 HCOLOR= 0:GOSUB 1000:PRINT CHR$(7);
150 r = r-30:HCOLOR= 1:GOSUB 1000
160 HCOLOR= 0:GOSUB 1000
170 PRINT CHR$(7);CHR$(7);CHR$(7);
180 VTAB 22:HTAB 2+21*(k$ = "Q"):PRINT "WINNER!"
190 END
1000 HPLLOT 127,r*ca(0)+79:FOR a = 1 TO 22
1010 HPLLOT TO r*sa(a)+127,r*ca(a)+79
1020 NEXT a:RETURN
```

APPLE II SERIES/BLOWING BUBBLES

```
10 DIM CA(22),SA(22):HOME:HGR
20 FOR L = 0 TO 22:SA(L) = 1.16*SIN(L*.2856)
30 CA(L) = -COS(L*.2856):NEXT L:VTAB 21:HTAB 1
40 PRINT "PRESS <Q> KEY.";SPC(12);"PRESS <P> KEY."
50 R = 20+INT(RND(1)*6):RF = R+5+INT(RND(1)*26):VTAB 1
60 HCOLOR= 3:GOSUB 1000
70 GET K$:K = ASC(K$):IF K = 3 THEN 190
80 K$ = CHR$(K-32*(K > 96)*(K < 123))
90 IF K$ <> "Q" AND K$ <> "P" THEN 70
100 HCOLOR= 0:GOSUB 1000
110 R = R+1:IF R < RF THEN 60
120 FOR D = 1 TO 300:NEXT D
130 R = R+20:HCOLOR= 3:GOSUB 1000
140 HCOLOR= 0:GOSUB 1000:PRINT CHR$(7);
150 R = R-35:HCOLOR= 3:GOSUB 1000
160 HCOLOR= 0:GOSUB 1000
170 PRINT CHR$(7);CHR$(7);CHR$(7);
180 VTAB 22:HTAB 4+26*(K$ = "Q"):PRINT "WINNER!"
190 TEXT:VTAB 1:END
1000 HPLLOT 140,R*CA(0)+80:FOR L = 1 TO 22
1010 HPLLOT TO R*SA(L)+140,R*CA(L)+80
1020 NEXT L:RETURN
```

ATARI 800, 800XL, & 130XE/BLOWING BUBBLES

```
10 DIM CA(24),SA(24),SS(28):GRAPHICS 8
20 OPEN #1,4,0,"K":POKE 752,1:POKE 82,0:POKE 83,39
30 SS=CHR$(32):SS(28)=CHR$(32):SS(2)=SS
40 DEG :FOR L=0 TO 24:SA(L)=1.1*SIN(L*15)
50 CA(L)=-COS(L*15):NEXT L
60 PRINT CHR$(125);" PRESS <Q> KEY.";SS(1,10);"PRESS <P> KEY."
70 R=20+INT(RND(1)*6):RF=R+10+INT(RND(1)*21)
80 COLOR 1:GOSUB 1000
90 GET #1,K:K=K-32*(K>96)*(K<123)
100 IF K<>80 AND K<>81 THEN 90
110 COLOR 2:GOSUB 1000
120 R=R+2:IF R<RF THEN 80
130 FOR D=1 TO 90:NEXT D
140 R=R+20:COLOR 1:GOSUB 1000:COLOR 2:GOSUB 1000
150 R=R-35:COLOR 1:GOSUB 1000
160 SOUND 0,90,12,15:FOR D=1 TO 30:NEXT D
170 SOUND 0,40,8,15:FOR D=1 TO 150:NEXT D
180 SOUND 0,0,0,0:COLOR 2:GOSUB 1000
190 PRINT SS(1,4+24*(K=81));"WINNER!"
200 PRINT SS(1,8);"PRESS <RETURN> TO EXIT.";
210 GET #1,K:IF K<>155 THEN 210
220 GRAPHICS 0:END
1000 PLOT 160,R*CA(0)+80:FOR L=1 TO 24
1010 DRAWTO R*SA(L)+160,R*CA(L)+80
1020 NEXT L:RETURN
```

IBM PC & COMPATIBLES/BLOWING BUBBLES

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/ColorGraphics Monitor Adapter, w/Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 KEY OFF:SCREEN 1,0:RANDOMIZE TIMER
20 COLOR 0,1:CLS:LOCATE 20,1
30 PRINT "Press <Q> key.";SPC(12);"Press <P> key."
40 R=20+INT(RND*6):RF=R+5+INT(RND*26)
50 CIRCLE (159,80),R
60 K$=INKEY$:IF K$="" THEN 60
70 K=ASC(K$):K$=CHR$(K-32*(K>96)*(K<123))
80 IF K$<>"Q" AND K$<>"P" THEN 60
90 CIRCLE (159,80),R,0
100 R=R+1:IF R<RF THEN 50
110 FOR D=1 TO 300:NEXT D:CIRCLE (159,80),R+20
120 CIRCLE (159,80),R+20,0:SOUND 120,2
130 CIRCLE (159,80),R-15:CIRCLE (159,80),R-15,0
140 SOUND 50,2:SOUND 51,1:SOUND 52,1
150 LOCATE 21,4-26*(K$="Q"):PRINT "WINNER!"
160 IF INKEY$<>"Q" THEN 160 ELSE END
```

MACINTOSH W/MICROSOFT BASIC 2.0 OR 2.1/BLOWING BUBBLES

```
10 WINDOW 1,"BLOWING BUBBLES", (0,38)-(527,338)
20 RANDOMIZE TIMER
30 CLS:LOCATE 14,1
40 PRINT "Press <Q> Key.";SPC(40);"Press <P> Key."
50 R=20+INT(RND*6):RF=R+10+INT(RND*51)
60 CIRCLE (263,120),R
70 K$=INKEY$:IF K$="" THEN 70
80 K=ASC(K$):K$=CHR$(K-32*(K>96)*(K<123))
90 IF K$<>"Q" AND K$<>"P" THEN 70
100 CIRCLE (263,120),R,0
110 R=R+2:IF R<RF THEN 60
120 FOR D=1 TO 600:NEXT D:CIRCLE (263,120),R+25
130 CIRCLE (263,120),R+25,0:SOUND 120,2
140 CIRCLE (263,120),R-15:CIRCLE (263,120),R-15,0
150 SOUND 50,2:SOUND 51,1:SOUND 52,1
160 LOCATE 15,4-51*(K$="Q"):PRINT "WINNER!"
170 PRINT TAB(25);"Press <RETURN> to exit.";
180 IF INKEY$<>CHR$(13) THEN 180 ELSE END
```


NEW HARDWARE & ACCESSORIES

COMPUTERS



Wang LapTop

Wang LapTop

MANUFACTURER: Wang Laboratories Inc.

ADDRESS: One Industrial Ave., Lowell, MA 01851; (617) 459-5000

PRICE: \$3,530

Wang, known primarily for its word-processing and data-processing computers, has introduced a general purpose laptop. Aimed at corporations, the LapTop is expensive. But the little powerhouse is an incredible object to examine. Five years ago this computer might have been someone's "perfect computer" fantasy. Today it's being mass produced.

The battery-operated LapTop, with 512K RAM and a Liquid Crystal Display screen, comes with a built-in, 10 MB hard-disk drive and a built-in thermal transfer printer that has a near letter-quality type. A 2400-baud modem can be installed (\$795).

A color/graphics adapter comes with the LapTop, so you can connect a color monitor. And it even has a high-speed SCSI port, most often used to connect hard-disk drives, popularized by the Macintosh Plus.

The LapTop is fully IBM compatible and can use both 5.25-inch (\$365) and 3.5-inch (\$518) disk drives. The computer comes with MS-DOS 3.2. And, of course, it runs Wang Word-Processing software.

Laser 128

MANUFACTURER: Video Technology; also distributed by Central Point Software.

ADDRESS: Video Technology: 400 Anthony Trail, Northbrook, IL 60062; (312) 272-6760; Central Point Software: 9700 S.W. Capitol Hwy. #100, Portland, OR 97219; (503) 244-5782

PRICE: \$479

The Laser 128 is an Apple-compatible computer that runs "most" Apple IIe and IIc software. It functions as a IIc and also has IIe capabilities, and has 128K RAM and an 80-column display. In addition, the Laser 128 has two serial ports (for a printer and a modem), a standard Epson-compatible parallel port, a mouse port, and one Apple-compatible expansion slot. The Sider hard-disk drive, among other peripherals, will work in this expansion slot.

The Laser 128 works with a television, any monitor that the IIc uses, or an IBM-style RGB monitor.

Programs that run include *AppleWorks*, *Newsroom*, the *PFS series*, *Lode Runner*, *Wizardry*, *Fantavision*, *The Print Shop*, *Bank Street Writer*, *MultiPlan*, *Summer Games I and II*, *Rocky's Boots*, *Mouse Paint*, *Sensible Speller*, *Archon*, and *Pinpoint*. Central Point Software will supply a software list.

PRINTERS

Laserline 6

MANUFACTURER: Okidata

ADDRESS: 532 Fellowship Rd., Mt. Laurel, NJ 08054; (609) 235-2600 or (800) OKIDATA

PRICE: \$2,195

Laser printers, which work like office copiers that take an image of a page and reproduce it, are the backbone of the desktop publishing craze. The quality of the print is far superior to even high-quality letter-quality printers and almost as good as actual typeset print.

The new Laserline 6 prints six pages per minute and is compatible with such software as *Microsoft Word*, *Wordstar 2000*, and *Lotus' 1-2-3*. It works much like the Hewlett-Packard LaserJet and LaserJet Plus. However, it is not compatible with software that requires a Postscript printer (as does most "desktop" software), such as the Apple LaserWriter.

Up to three computers can be connected to the Laserline. Each Laserline printer must have its own personality module (from \$200 to \$600).

The printer has a life of 180,000 pages, or five years, according to the manufacturer. Telephone support is available at (800) OKIDATA.

MODEMS

Okitel 1200

MANUFACTURER: Okidata

ADDRESS: same as above

PRICE: \$449

Okidata, primarily a printer manufacturer, has introduced a 1200-baud modem for the consumer market. It already sells a 9600-baud modem. The Okitel 1200 is Hayes compatible, and can be used with both touch-tone and rotary phone systems.

The modem has an Automatic Adaptive Equalization feature, which helps it adjust to "dirty" or "noisy" phone lines, according to the manufacturer. In addition, users can program the Okitel 1200 to maintain phone connection during line interruptions, such as those caused by call-waiting signals.

SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PCjr or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone means the software will run only on that machine.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
GEOS Berkeley Softworks 2150 Shattuck Ave. Berkeley, CA 94704 (415) 644-0890 \$60 ©1985, 1986	Do you yearn for icons, windows, pull-down menus, and mouse or joystick control on your C 64 or 128? Yearn no longer, for you get those features and more with GEOS.† —LATIMER	C 64/128. Joystick or mouse.	90-day warranty. \$12 thereafter. User makes backup.	★	★	★	★	E	★
HOMEWORKER Davidson & Associates 3135 Kashiwa St. Torrance, CA 90505 (213) 534-4070 \$90 ©1986	Designed to help students ages 12 and up, this package integrates a word processor, an outliner, a flash-card maker, a calendar, a grade keeper, and a calculator. Comes in special binder.† —SOLOMON	128K Apple IIe/IIc. 2nd drive optional.	5-year warranty. \$10 for backup.	★	★	★	N/A	A	★
KIDSTIME Great Wave Software 104 Gilbert Ave. Menlo Park, CA 94025 (415) 325-2202 \$50 ©1986	Contains five programs varied enough to entertain and teach kids from preschool to preteens. Includes a program to write or play music, and a story-writing program that actually speaks.† —AKER	Macintosh.	90-day warranty. User makes backup.	★	★	★	★	E	★
STICKYBEAR MATH 2 Weekly Reader Family Software 245 Long Hill Road Middletown, CT 06457 (203) 638-2400 \$40 ©1986	From basic multiplication up to division of six-digit numbers. <i>Stickybear</i> uses animation and sound to dress up drill and practice so that kids (ages 7-12) actually enjoy it. —ELTGROTH	Apple.	90-day warranty. \$10 for backup.	★	★	★	★	A	★
WALT DISNEY COMIC STRIP MAKER Bantam Software 666 Fifth Ave. New York, NY 10103 (212) 765-6500 \$33-\$40 ©1986	Make up one-to-three panel comics starring Mickey Mouse and his pals, or use the cartoons that come on disk. Offers occasional diversion, and it might even inspire a child to write. —SUTHERLAND	Reviewed on 64K Apple. Also for C 64/128. Graphics capable, dot-matrix printer.	90-day warranty. \$5 thereafter.	★	★	★	★	E	★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

SOFTWARE GUIDE

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	EH	GQ	EU	V	
BANK STREET WRITER PLUS Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1185 \$100 ©1986	Incorporates many features found in professional word processors (e.g., macros and spell checker) with easily accessed help screens and a thorough tutorial. Can work for a family of writers. —ELTGROTH	IBM PC/PCjr.*	90-day warranty. \$7.50 thereafter. User makes backup.	★	★	★	N/A	E	★	★
E-Z CALC Royal Software 2160 W. 11th Eugene, OR 97402 (503) 683-5361 \$70 ©1986	Takes full advantage of the ST's mouse and pull-down menus to remove the mystery from spreadsheets. On-screen help is readily available; that's important because the documentation is skimpy. —STERN	Atari ST.	1-year warranty. User makes backup.	★	★	★	★	E	★	★
FONTWORKS The Software Touch 9625 Black Mountain Rd. San Diego, CA 92126 (619) 549-3091 \$50 ©1985, 1986	An AppleWorks add-on that's fun. Select up to 17 typefaces—such as large Old English or Times—for printing your letters, reports, and spreadsheets. Works with a printer's graphics mode, so it's slow. —SOLOMON	Apple IIe/IIc. AppleWorks. Graphics-capable, dot-matrix printer.	Unlimited warranty. User makes backup.	★	★	★	★	A	★	★
THE FIRST XLENT WORD PROCESSOR Xlent Software P.O. Box 5228 Springfield, VA 22150 (703) 569-8881 \$30 ©1986	This powerful word processor uses joystick control for fast, efficient cursor movement, like when you cut and paste. A lot of commands to remember, but an excellent range of capabilities makes it worth the effort.† —MORGENSTERN	Atari. Joystick optional.	90-day warranty. User makes backup.	★	★	★	N/A	A	★	★
JANE Commodore Business Machines 1200 Wilson Drive West Chester, PA 19380 (212) 436-4200 \$50 ©1985	It's a good introductory program for children, but Commodore's integrated word processor, data base, and spreadsheet seems too little for the rest of us. Icons make it easy. —BRADLEY	C 128. Mouse, joystick, 2nd drive optional.	Sold as is. \$10 for backup (per disk.)	★	★	★	★	A	★	★
SPELLSWELL Greene, Johnson Inc. 15 Via Chualar Monterey, CA 93940 (408) 375-2828 \$60 ©1986	If you're old enough to write, you can benefit from this simple-to-use, yet full-featured spelling checker. With a 60,000-word dictionary to start, you can add new words quickly. —AKER	512K Macintosh.	90-day warranty. \$5 thereafter. User makes backup.	★	★	★	N/A	E	★	★
TEMPLATES OF DOOM Solar Systems Software 8105 Shelter Creek San Bruno, CA 94066 (415) 952-2375 \$50 ©1985, 1986	It's an adventure game. It's a program to help you learn Lotus' 1-2-3. It's both. A variety of clever puzzles leads you through Lotus commands; the wit keeps your interest up.† —BELLONE	256K IBM PC.* Lotus' 1-2-3 (release 1A & 2), The Twin, or VP-Planner.	30-day warranty. User makes backup.	★	★	★	N/A	A	★	★
WEBSTER'S NEW WORLD ON-LINE THESAURUS Simon & Schuster Software One Gulf + Western Plaza New York, NY 10023 (212) 333-5800 \$70 ©1986	Looking for a better word? With this program, you can find new words as you write. At a keystroke, a screenful of synonyms appears. Highlight the word you want to insert, press another key, and the work is done. —MORRIS	Reviewed on IBM PC.* Also for 256K PCjr. Color monitor, 2nd drive recommended.	30-day warranty. \$5 for 11 months thereafter. User makes backup.	★	★	★	N/A	E	★	★
WEBSTER'S NEW WORLD WRITER Simon & Schuster Software (See above for address and phone.) \$150 ©1986	A menu-driven, multi-featured word processor that's integrated with a thesaurus (see above) and spelling checker. Superb help screens aid novices.† —MORRIS	256K IBM PC.* 2nd drive. Color monitor, graphics printer recommended.	30-day warranty. \$5 for 11 months thereafter. User makes backup.	★	★	★	N/A	A	★	★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

**ALL
NEW**

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Commodore User's Check List

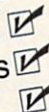
Word Processing:

- true word wrap
- on screen help menus
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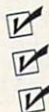
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CIRCLE READER SERVICE 42

ENTERTAINMENT REVIEWS BY JAMES DELSON

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
CO & CO Radarsoft, dist. by ACK, Inc. 655 John Muir Drive San Francisco, CA 94132 (415) 239-5357 \$20 ©1985	Cooperation is the theme as two players advance through a series of <i>Lode Runner</i> -type maze screens. The game's unique play system requires gamers to help each other. For ages 8+.	C 64/128. Joystick(s).	90-day warranty. \$5 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
DIABLO Classic Image, Inc. 510 Rhode Island Ave. Cherry Hill, NJ 08002 (609) 667-2526 \$20-\$30 ©1986	Your challenge? Keep a ball rolling around the screen by moving pieces of track in its path. Then track segments disappear as the ball crosses them. Requires fast reflexes.	Reviewed on Amiga. Also for Adam, Atari, Atari ST, C 64/128.	90-day warranty. User makes backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
INFILTRATOR Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$30 ©1986	Combines shoot-'em-up action, helicopter flight simulation, and prison-escape adventures. Difficult to learn (especially air-to-air combat), but a winner all the way. For ages 10+.	Reviewed on C 64/128. Also for 64K Apple, IBM PC/PCjr.* Joystick optional.	90-day warranty. \$12.50 thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	D	★ ★ ★ ★
OGRE Origin Systems, dist. by Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$40 ©1986	An edge-of-the-seat board-game adaptation that pits a futuristic human army against a cybernetic supertank on a nuclear battlefield. The excitement hurtles along at juggernaut pace.	Reviewed on 64K Apple. Also for Atari, Atari ST, C 64/128. Joystick, mouse optional.	90-day warranty. \$7.50 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
PURE-STAT BASEBALL subLOGIC 713 Edgebrook Drive Champaign, IL 61820 (217) 359-8482 \$50 ©1986	Manage any 1985 Major League team, a historical team, or input stats for your own ballplayers. A great variety of play options in hitting, pitching, and fielding.†	Reviewed on C 64/128. Also for 64K Apple. Joystick optional.	6-month warranty. \$5 for 10 years thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
THE ROCKY HORROR SHOW Electric Dreams/Activision 2350 Bayshore Frontage Rd. Mountain View, CA 94043 (415) 960-0410 \$30-\$35 ©1984	In this strategy/arcade adaptation of the cult movie of the same title, one player (as Brad or Janet) must search Dr. Frank N. Furter's eerie mansion for pieces of a machine that can re-animate their loved one.	Reviewed on Apple. Also for C 64/128. Joystick.	90-day warranty. \$7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
ROMMEL: BATTLES FOR TOBRUK Game Designer's Workshop P.O. Box 1646 Bloomington, IL 61702 (309) 452-3632 \$40 ©1986	You take either the Allied or German side in this highly detailed re-creation of the World War II North African campaigns. Many options, including "instant replay," make this one top-notch.	Atari. Joystick optional.	1-year warranty.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
SHARD OF SPRING Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1200 \$40 ©1986	Guide up to five heroes through an extensive, challenging quest. A role-playing adventure that mixes magic, fighting, dungeons, and dangers into a first-rate game for all levels.†	Reviewed on Apple IIe/IIc. Also for C 64/128. Joystick optional (C 64).	30-day warranty. \$10 thereafter. \$12 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
SPINDIZZY Electric Dreams/ Activision (See above for address and phone.) \$30-\$35 ©1986	An outstanding arcade game with style and a sense of humor. You move pieces through scores of maze screens, negotiating obstacles to obtain jewels that extend the game.†	Reviewed on C 64/128. Also for 64K Apple. Joystick.	90-day warranty. \$7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
STAR TREK: THE KOBAYASHI ALTERNATIVE Simon & Schuster Software One Gulf + Western Plaza New York, NY 10023 (212) 333-5800 \$40 ©1985	This text-only adventure places you in Captain Kirk's spaceboots, along with all the familiar "Star Trek" characters and many new beings, too. Difficult, but engrossing; suitable for the expert and patient novices.	Reviewed on 64K Apple. Also for C 64/128, IBM PC/PCjr.* 512K Macintosh.	30-day warranty. \$5 for 11 months thereafter. User makes backup.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	D	★ ★ ★

RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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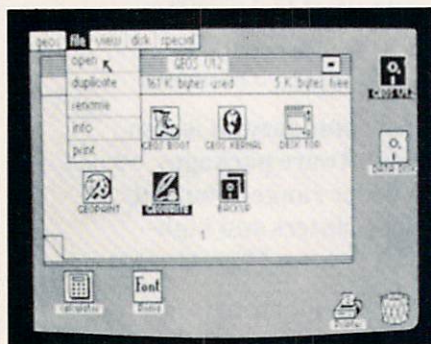
SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 93 for information such as backup policies and addresses of software publishers.

EDUCATION/ FUN LEARNING

GEOS

HARDWARE REQUIREMENTS: C64/128.
PUBLISHER: Berkeley Softworks
PRICE: \$60
PUBLISHER'S SUGGESTED AGES: 15 +



GEOS, short for Graphic Environment Operating System, revolutionizes computing for Commodore 64 and 128 owners. The GEOS disk replaces the cumbersome disk operating system built into both machines with a sleek new one. Features like icons, windows, and pop-down menus, as well as joystick or mouse operation, make file maintenance a breeze. Add a color-graphics paint program, a word processor with several fonts, a disk backup program, a calculator, a note pad, and an alarm clock—and GEOS becomes one heck of a package. As a special bonus, the back of the GEOS disk contains a terminal program for accessing QuantumLink, the telecommunications network for Commodore users.

When starting off, it's important to make "work disks," which are essentially backups of the original GEOS disk that have been "stripped down" to allow room on them for programs and work files. Stripping down a disk means you eliminate GEOS features that you think you won't need on a particular work disk. For instance, I made one work disk for *geoPaint* (the color graphics editor); since I didn't want such GEOS programs as *geoWrite* (the word processor) and the disk backup program taking up valuable work

space, I deleted them.

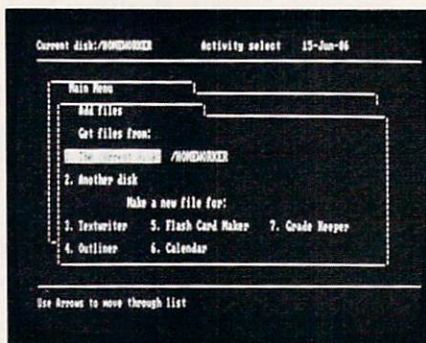
Once you have made work disks and entered the Graphic Environment Operating System, selections are made by moving a mouse or joystick, while keeping your eye on an arrow displayed on-screen. When the arrow points at the pull-down menu, label, or icon of your choice, you make a selection by clicking the button on your mouse or joystick.

GEOS is really the closest thing I've seen running on an eight-bit Commodore computer that delivers the same ease of use and speed I'm used to with the Macintosh, Amiga, and Atari ST. GEOS is also pretty easy for a casual computer user, like my wife, to learn without much agony (compared to the trouble she had with the older C 64 operating system). GEOS truly brings the C 64 and C 128 into the late eighties with style.

—JOEY LATIMER

Homeworker

HARDWARE REQUIREMENTS: 128K Apple IIe/IIc.
PUBLISHER: Davidson & Associates
PRICE: \$90
PUBLISHER'S SUGGESTED AGES: 14 +



"Will it do my homework for me?" asked my 14-year-old daughter, Debbie, when she opened *Homeworker*. While it didn't take over her responsibilities, it did help her to organize and complete her assignments.

Homeworker is made up of six integrated, easy-to-use programs. Textwriter is surprisingly like the sophisticated *AppleWorks* word processor, but with a few special features of its own, such as changing the screen background from dark to light and vice versa. Outliner is similar to more expensive products for structuring and storing notes in outline form. Flash Card Maker, Calendar, and Grade Keeper are features of *Homeworker* that elegantly do what their names imply. The Calculator, with 10 memory locations

and built-in conversion tables, is accessed from any of the programs.

My daughter's introduction to *Homeworker* was through the Calendar, so she could keep track of days off from school and parties, and, to make it legitimate, impending class assignments. The first item nearing deadline was a social studies report.

Debbie reviewed the notes she had taken in the library and began an Outliner file. She created a sophisticated Harvard outline that zooms out to include notes, quotations, bibliographic citations, and whole paragraphs. With such a detailed outline saved as a Textwriter file, it was easy for her to write the first draft and eventually the final paper.

Debbie charted her marks with Grade Keeper, and, because of it, studied harder than usual for her next major test in American History. The reason? The program showed that because of the heavy weight placed on the exams, a high grade would reward her with a high average. She turned to Flash Card Maker to help her prepare study material on names and dates of battles, patriots, and other essential information.

The package contains excellent documentation, a loose-leaf binder with school supplies, and a copy of *How To Study for Success*. What it adds up to is exceptional value in a single piece of multipurpose software.

—GWEN SOLOMON

KidsTime

HARDWARE REQUIREMENTS: Macintosh.
PUBLISHER: Great Wave Software
PRICE: \$50
PUBLISHER'S SUGGESTED AGES: 3–8

Despite the Macintosh's ease of use, good programs for young kids have been few and far between. But since we discovered *KidsTime*, a five-program collection, I'm actually shopping for a second-hand Mac so the kids can have one of their own.

Story Writer is wonderful. Your child (or you, if no one's looking) types a story and has the Mac read it back—yes, *KidsTime* talks! An extra twist lets you insert pictures using the special Storybook font provided; the Mac will read the picture (like that of a cat or an umbrella) as the word it represents.

Making music is as simple as clicking on the piano keyboard on the screen with KidsNotes. You can save a composition for another time by recording it as you hit the keys,

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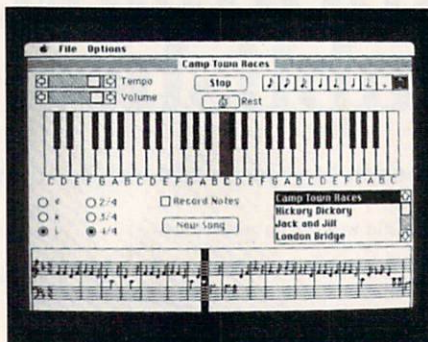
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SOFTWARE REVIEWS

or compose a piece more leisurely (and perhaps more accurately) by defining notes with various on-screen buttons. Everything you play is shown on a scrolling staff at the bottom of the screen.



KidsTime gives you three more programs. The first, *ABKey*, lets youngsters practice with upper- and lowercase letters and the sounds they make. *Dot-to-Dot* is the electronic version of the pencil-and-paper standard; you choose to label the dots with numbers or letters, and you can create your own "dotted" pictures with *MacPaint*. The *Match-It* program comes with only a few sample games, but as a registered owner of *KidsTime*, you can send for a game editor that lets you make more *Match-It* games.

With enough variety to serve everyone from preschoolers to preteens, *KidsTime* proves the Mac can be a kid's computer, too. And that same variety should keep them busy until some more good programs for kids are available.

—SHARON ZARDETTO AKER

HOME BUSINESS & PRODUCTIVITY

The First XLEnt Word Processor

HARDWARE REQUIREMENTS: Atari.

PUBLISHER: XLEnt Software

PRICE: \$30

For basic word-processing tasks, it is hard to find more functional economical computers than the Atari 800/XL/XE line. If you can accept the 40-column display limitation, just about any feature you could ask for has been incorporated into existing Atari word processors. Now there's a new word processor that fills in some of the few remaining word-processing gaps in ingenious ways.

The first substantial brainstorm is

the use of a joystick to control cursor positioning. While there is nothing you can do with the joystick that cannot be done with the keyboard, the joystick makes moving through the document exceptionally speedy.

The joystick is also used to select from six on-screen icons, representing the Print, Copy, Cut, Paste, Search, and Disk Utility functions. Moving, removing, or copying blocks of text can be accomplished without taking your hand off the joystick.

The other major new feature is the ability to open two separate windows at once. This means you can have two documents in computer memory simultaneously, switch between them instantly, and even move blocks of text from one to the other.

Unfortunately, you will have to memorize a lot of command key and letter combinations to format your document. However, on-screen help is available for fast reminders. And once you get the hang of the command key combinations, you can do almost anything, including fancy headers and footers, linking multiple files for chain printing, and accessing any special printer features.

The documentation is adequate, but could be clearer in parts and lacks an index (a significant shortcoming). Also, only Epson printers are directly supported; otherwise, you'll have to create a printer driver using your printer manual and the Printer Driver creator included.

While the *XLEnt* package does not match the current market leader, *AtariWriter*, for ease of use, it does provide enough significant new features to give the standard Atari word-processing package a real run for its money. —STEVE MORGENSTERN

Templates of Doom

HARDWARE REQUIREMENTS: 256K IBM PC.

PUBLISHER: Solar Systems Software

PRICE: \$50

Now that you've completed Lotus' 1-2-3 tutorial with its dry, step-by-step approach to learning the spreadsheet's commands, where do you go from here? Start building a spreadsheet, or just give up?

Neither, if you have *Templates of Doom*, a tongue-in-cheek adventure game that tests and improves your knowledge of 1-2-3's commands. (It also works with two Lotus-compatible spreadsheets, *The Twin* and *VP-Planner*.) Like all good adventure

games, there's a hero, a villain, a girlfriend, weapons, secret codes, and even the hero's pet.

Through a series of 16 games (the final one made up of nine mini-games and no help screens), you're led through a variety of clever puzzles. By using different commands, you uncover such information as the hero's name, who the villain is, and exactly what evil trick he's got up his sleeve to destroy the world.

One puzzle, for example, has you try to uncover what weapon the villain may use. In this case, by using the Lotus graphing functions and correctly plotting several given numbers on a line graph, the connected lines spell out the answer. Another puzzle makes you move and delete rows and columns to find out what the hero's weapon is.

It's fun, but it's tough, and it gets tougher as you go along. If you're stumped, there's help; however, it will cost you points. As an experienced spreadsheet user, but a novice to Lotus' 1-2-3, I found *Templates of Doom* helpful in pinpointing my weaknesses. I even forgot that I was supposed to be learning. I guess that's the point. —ROBERT BELLONE

Webster's New World Writer

HARDWARE REQUIREMENTS: 256K IBM PC.

PUBLISHER: Simon & Schuster
PRICE: \$150

This *Webster's New World* package features *Writer*, a word processor clearly designed with the beginner in mind. It also contains their two other four-star programs: *On-Line Thesaurus* (see *Software Guide in this issue*) and *Spelling Checker* (see review in the February 1986 issue of *FAMILY COMPUTING*). While both writing helpers can be bought separately and used effectively with a wide range of other word processors, this package integrates them with the *Writer* word processor for just \$20 more.

An extensive set of menus makes *Writer* easy to learn. With experience, users can bypass some (but not all) of the menu operations by substituting single keystroke commands. The superb help screens can also be called up with a keystroke, or you can have them appear automatically after a few seconds have passed with no keyboard input. All help screens are "context-sensitive," which means they apply to the im-

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SOFTWARE REVIEWS

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Even though *Writer* is an exceptionally powerful word processor, its limitations are similar to those of most other low-priced packages. For instance, there's no footnote capability, nor is there a macro function to help you automate specific operations.

In contrast to the software itself, the documentation is surprisingly uneven. For the most part, the manual is clearly written, but important sections appear only in a loose, supplementary manual. This manual is itself supplemented by a disk file that lists further modifications to the software. The resulting bits-and-pieces approach, and minimal information on some of the more advanced features, take away from what is otherwise an extremely attractive and powerful package.

—TONY MORRIS

ENTERTAINMENT

Pure-Stat Baseball

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.

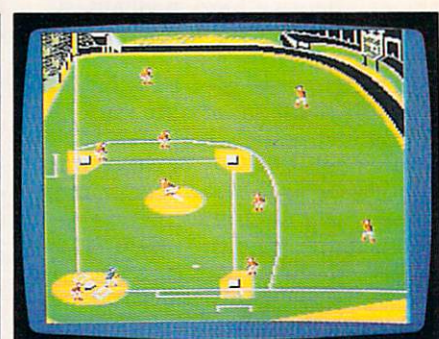
PUBLISHER: subLOGIC

PRICE: \$50

CRITIC'S SUGGESTED AGES: 12 +

A wealth of options, ballplayers, and teams fill this strategy baseball game. As the manager, you use Major League teams from 1985, eight great teams from the past (such as the 1961 Yankees and the 1975 Red Sox), or what-if teams mixed and matched from the lineups of any existing roster. These made-up teams can compete against historical teams or other imaginary ones managed by you, the computer, or a human opponent.

Once the game gets underway, the team in the field chooses defensive strategy and pitching options, while the team at bat chooses batting and



base-running tactics. Each play session results in an exciting, often tense, and always enjoyable 30-to-60-minute game. But, for those interested in playing a season's worth of games in an afternoon, the computer can resolve the entire contest in about three minutes.

Thus far, this is pretty familiar ground. But *Pure-Stat* allows you to update ballplayer stats after each game. This can keep all your favorites current, and can reflect your ability as a manager. Purists who prefer the original stats needn't bother to update, but this feature turns team sports games into role-playing adventures, which offers a new world of possibilities.

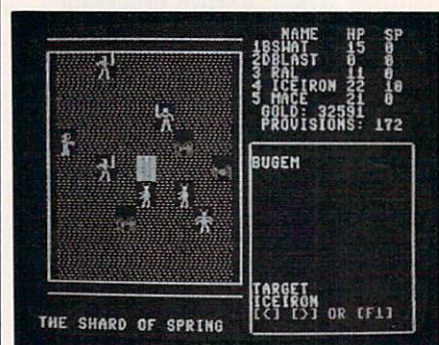
Shard of Spring

HARDWARE REQUIREMENTS: Apple IIe/IIc, C 64/128.

PUBLISHER: Strategic Simulations, Inc.

PRICE: \$40

CRITIC'S SUGGESTED AGES: 12 +



This extensive fantasy, role-playing adventure lets you create as many characters as you wish, and then guide up to five of them on a challenging quest for the "shard of spring." In giving life to your heroes, you can choose from five different races and two fixed professions, and assign them a wide array of magical, fighting, and other abilities. As your adventurers gain experience, they can acquire new skills and spells, as

well as higher hit points, spell points, and combat effectiveness.

The game is played on a huge scrolling map (*Ultima* style), but I would suggest drawing your own full-scale version on graph paper to make your travels faster and more accurate. The combat system, similar to that of *Wizard's Crown*, demands that you control your characters in battle with great accuracy in order to stay alive. Running away from a fight is not only permitted, it is suggested in the early stages.

Among adventures, *Shard of Spring* is first-rate.

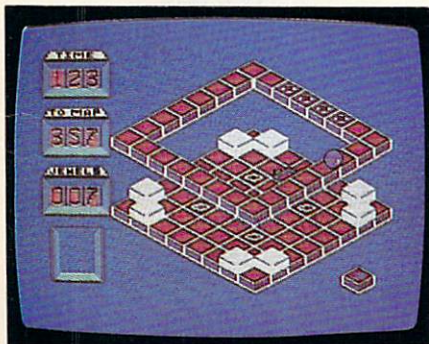
Spindizzy

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.

PUBLISHER: Electric Dreams/Activision

PRICE: \$30-\$35

CRITIC'S SUGGESTED AGES: 8 +



Bright graphics, charming music, and a nonstop, thrill-a-second play system make *Spindizzy* an arcade delight for players at all experience levels. One or two gamers guide 3-D playing pieces through scores of maze screens while negotiating increasingly difficult obstacles. Your goal is to obtain the jewels that help you complete each game level.

You practice on the easy screens, then wend your way through mazes, up and down inclines, and over and around various levels with the aid of flying carpets and elevators. Mastering the joystick requires hours of practice because sufficient control must be exerted not to drop off edges without warning (Like the classic *Q-Bert*, or the newer *Marble Madness*, *Spindizzy* is set in the void of space.) But once you know what you're doing, this stylish game offers outstanding play. It's a must for arcade fans, and worth the time of even moderate devotees.

—REVIEWS BY JAMES DELSON

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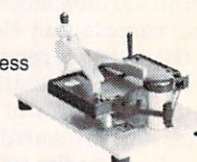
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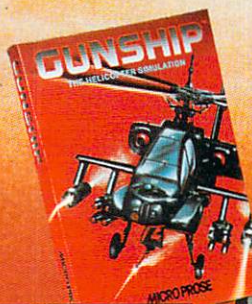
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